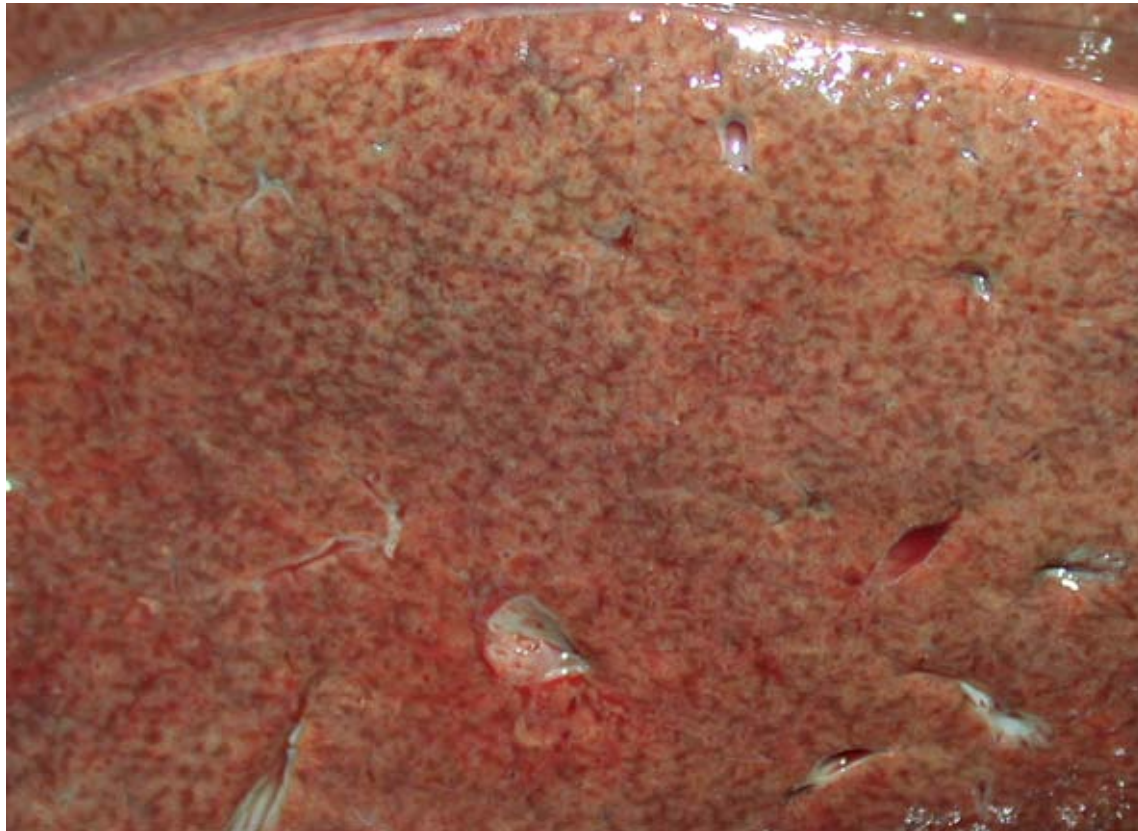


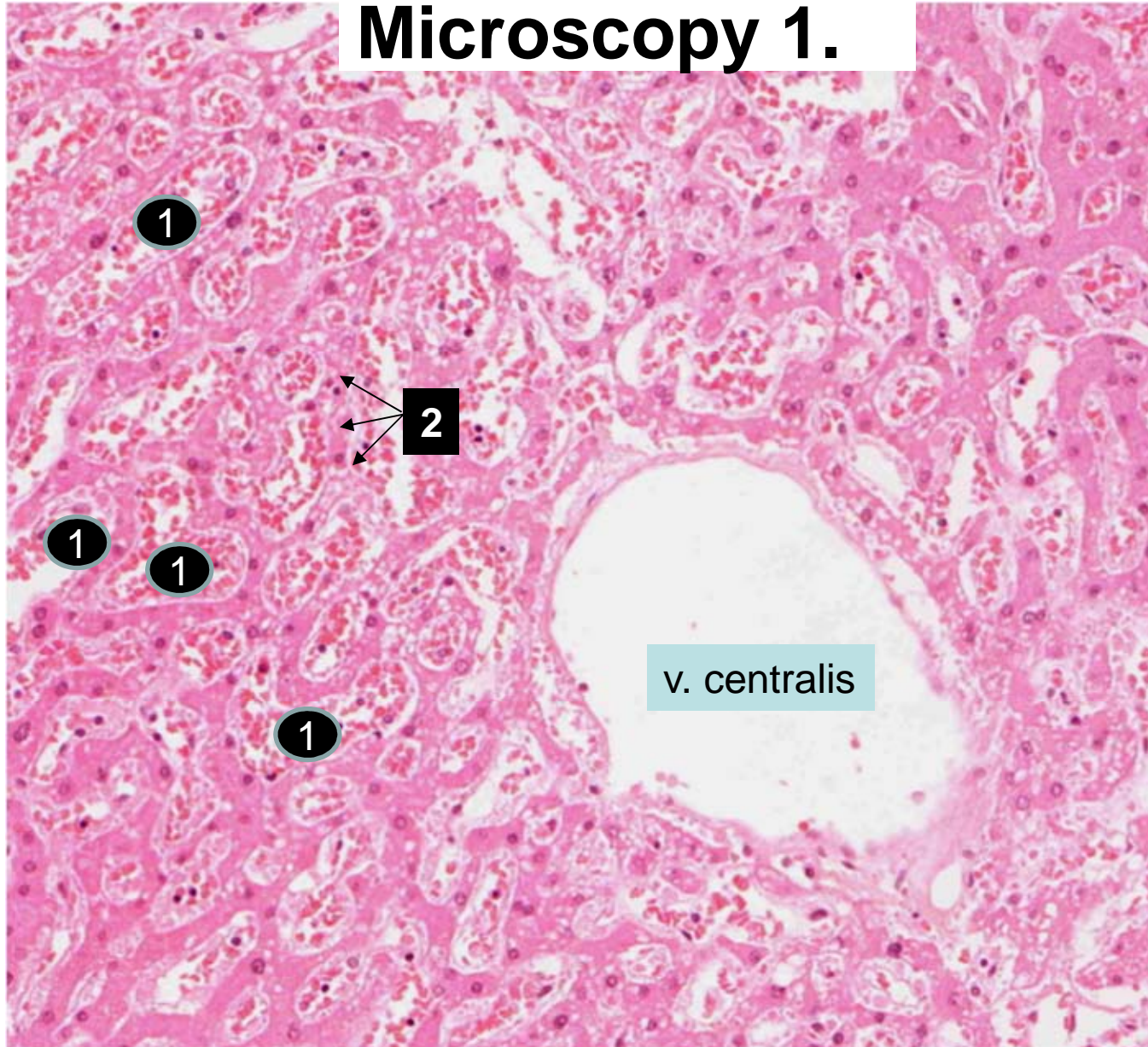
Hepar moschatum

Macroscopic appearance	
Localisation	Diffuse
Pattern	Lobular structure
Colour	Red spots in the center of the lobules
Consistency	Unchanged
Other	May cause slight hepatomegaly In chronic cases may mimic portal fibrosis-cirrhosis! Centrolobular necrosis in cases of shock
Microscopy	
1.	Centrolobular sinusoidal stasis+atrophy of liver cell trabeculae
2.	In longstanding cases: portal fibrosis
3.	In shock: centrolobular necrosis

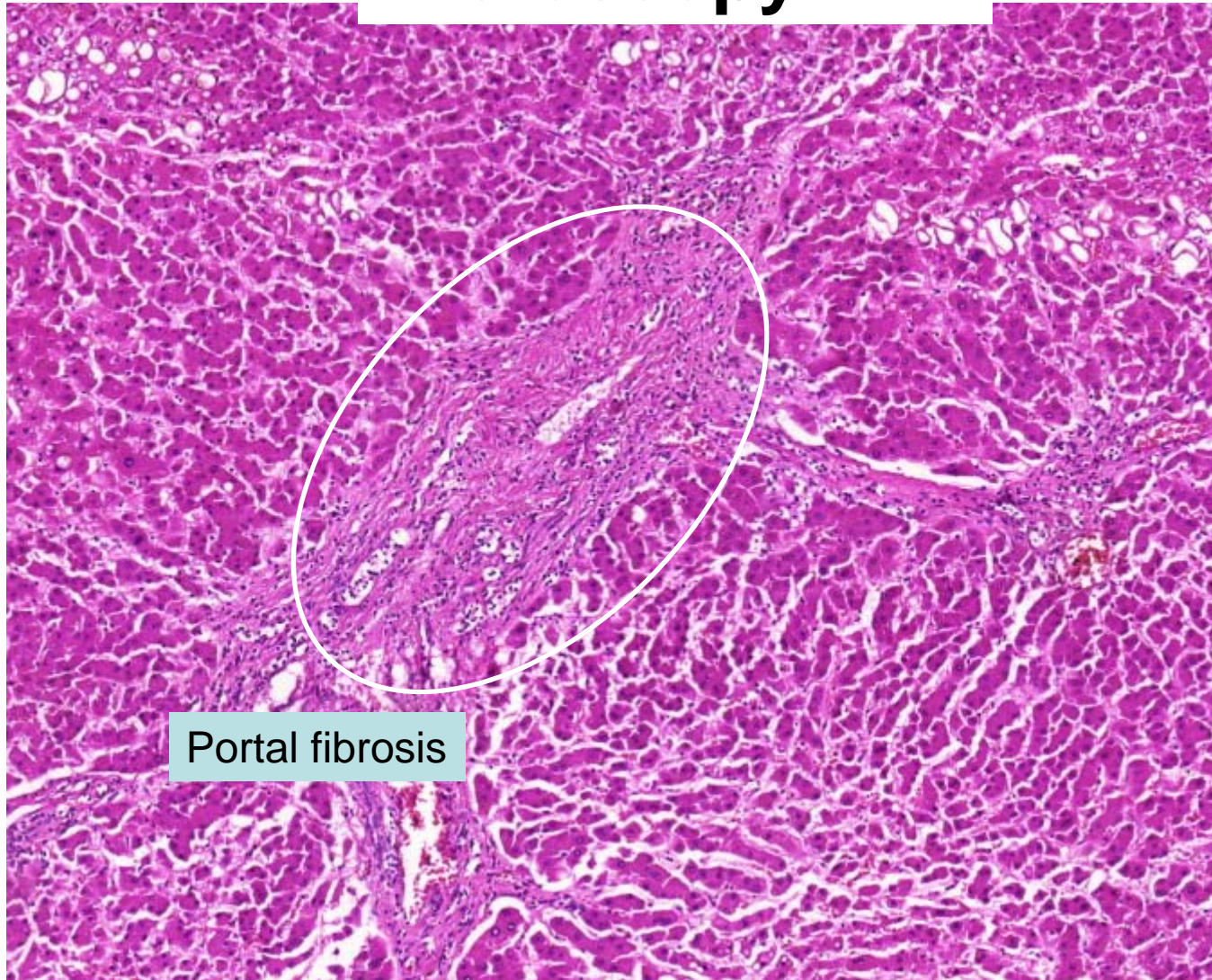
Macroscopy



Microscopy 1.

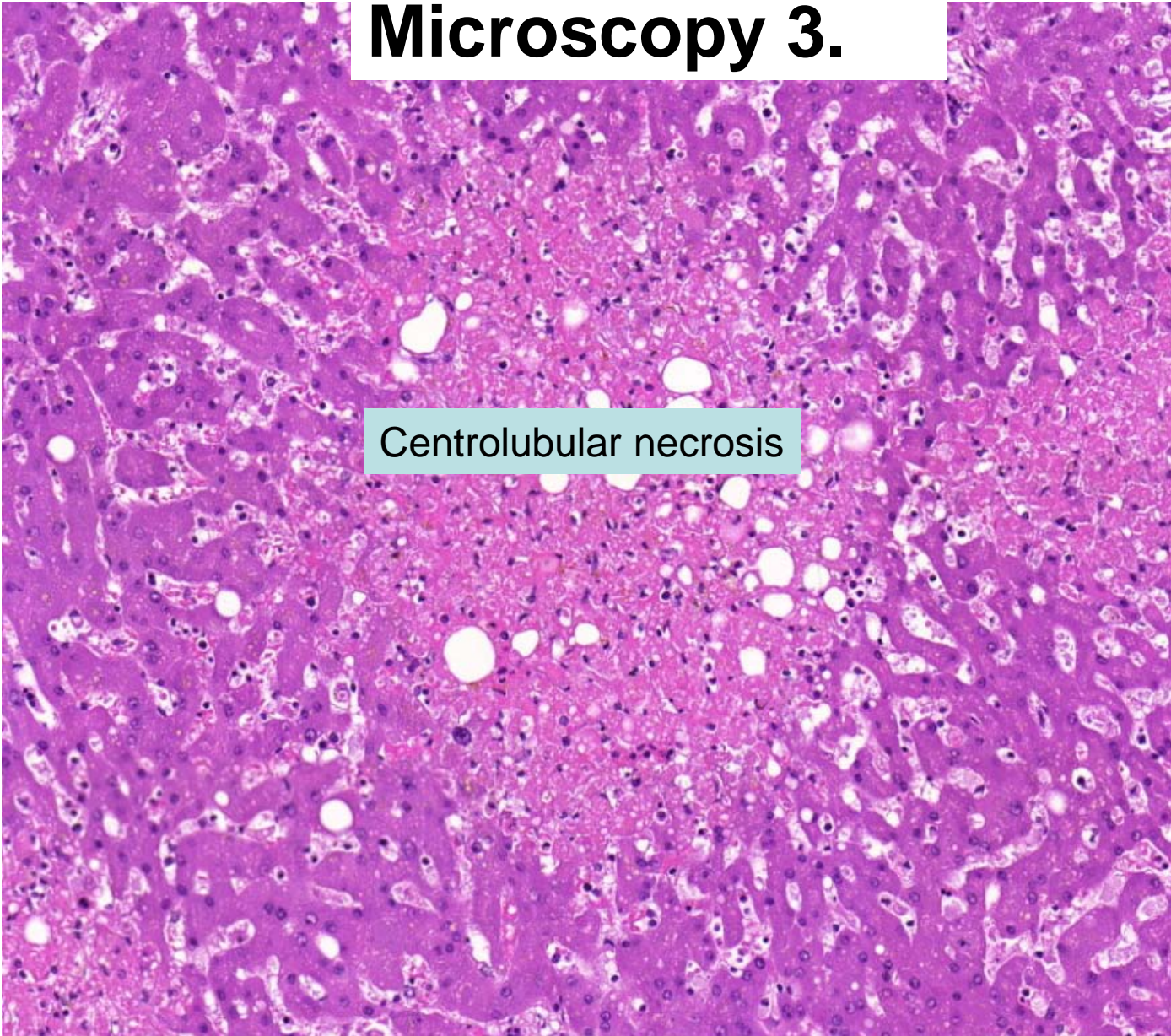


Microscopy 2.



Portal fibrosis

Microscopy 3.

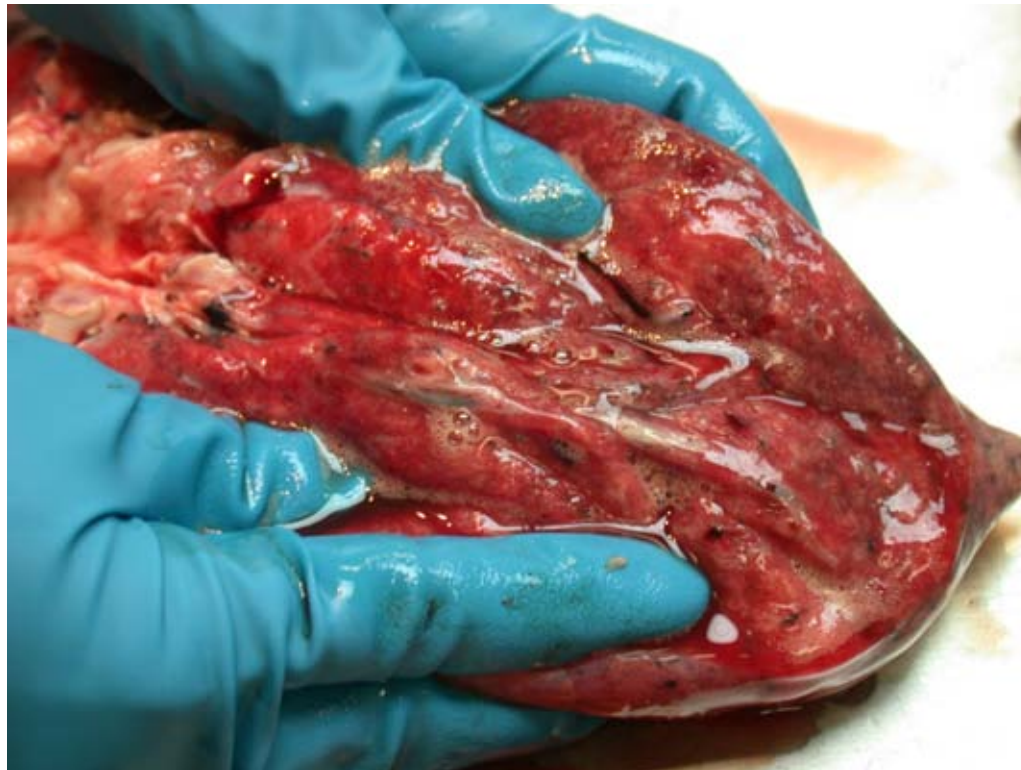


Centrilobular necrosis

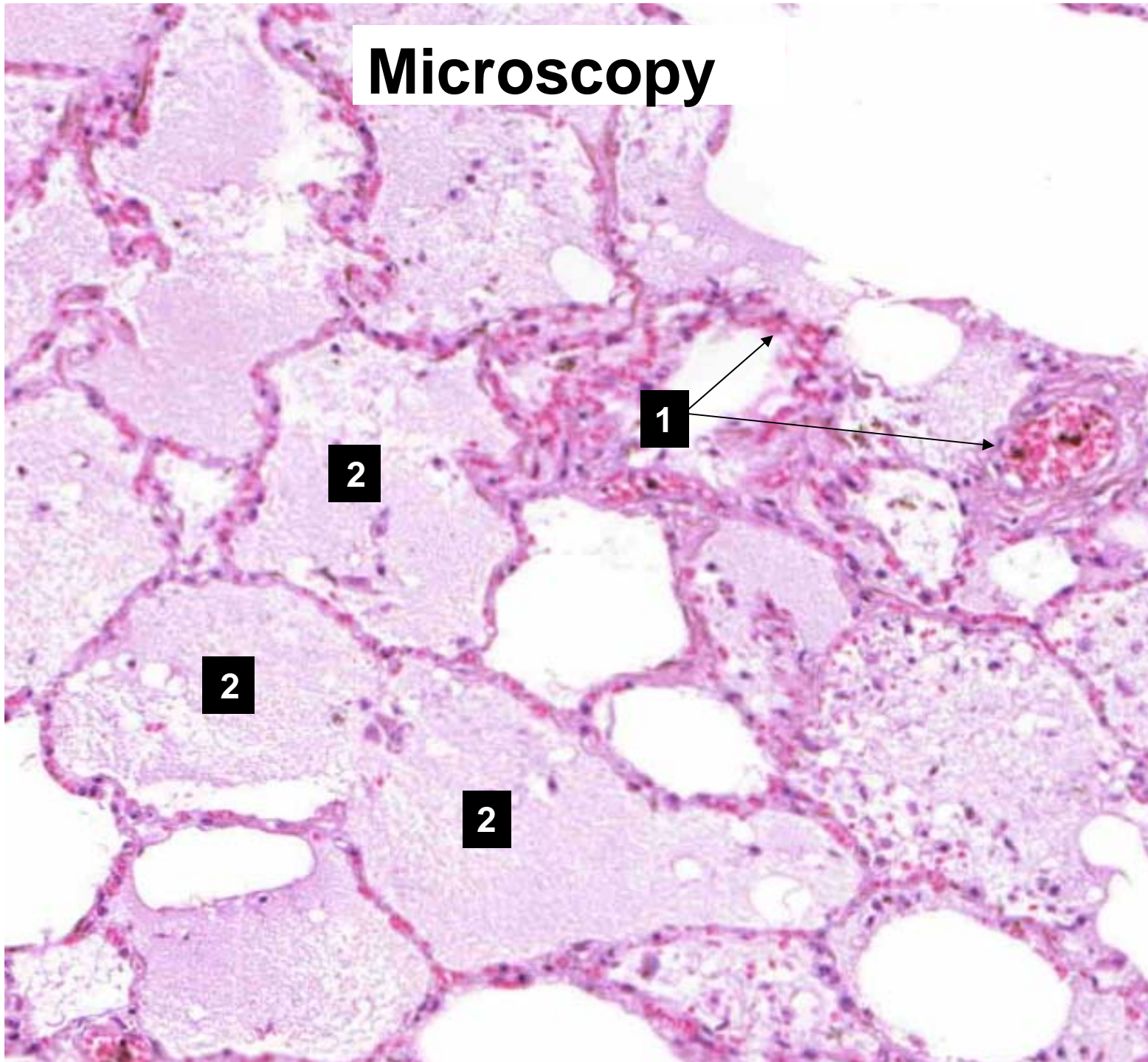
Oedema pulmonis

Macroscopy	
Localisation	Diffuse (more pronounced basally)
Pattern	Homogenous
Colour	Red
Consistency	Slightly firm
Other	Increased weight, considerable fluid content (=transudatum, „fluffy transparent, bloody fluid”)
Microscopy	
1.	Venous/capillary stasis
2.	Intraalveolar pale eosinophilic material (=transudatum)

Macroscopy



Microscopy



Hemosiderin in alveolar macrophages

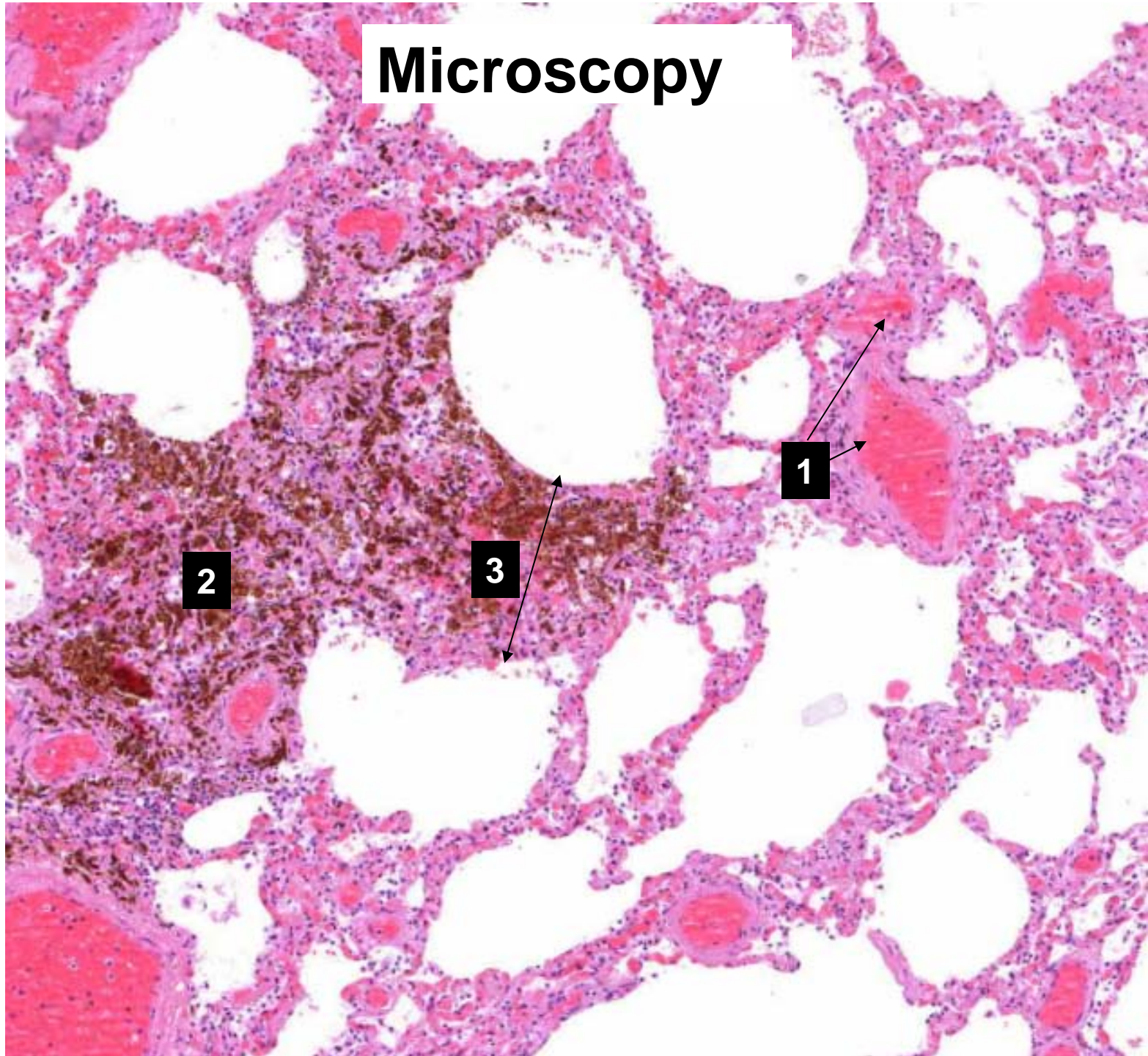
(= cardiac failure cells; chronic hyperaemia)

Macroscopy	
Localisation	Diffuse
Pattern	Homogeneous
Colour	Brownish-reddish
Consistency	Firm („induratio brunea pulmonis”)
Other	May cause slight increase of weight
Microscopy	
1.	Venous/capillary stasis
2.	Intraalveolar and interstitial macrophages with brown pigment (=hemosiderin, Prussian blue positive)
3.	Widened alveolar septa (=interstitial fibrosis)

Macroscopy



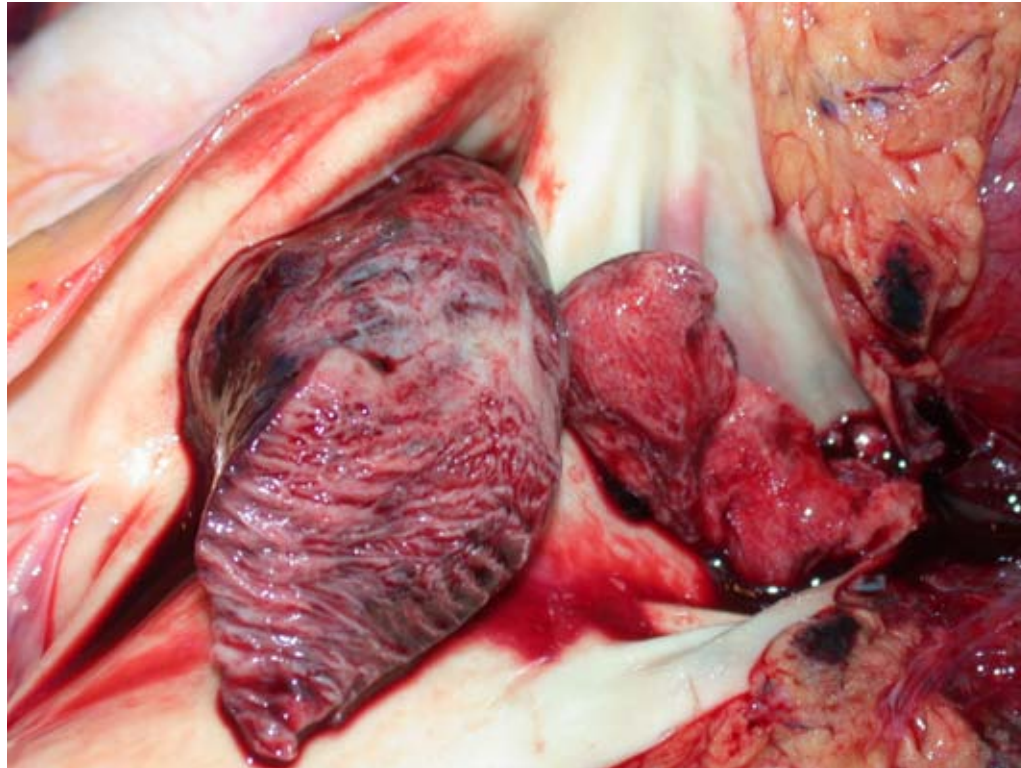
Microscopy



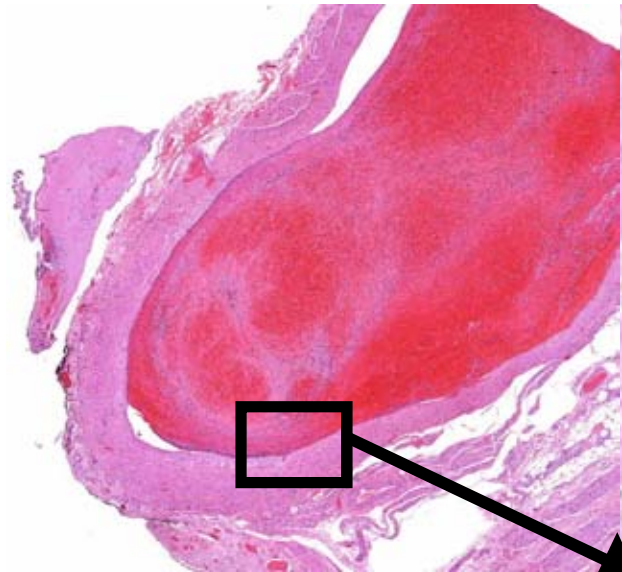
Organizing thrombus/embolus

Macroscopy	
Localisation	Intravascular
Pattern	Arteries: layered structure Venous: less orderly, net-like structure
Colour	Grayish-red, non shining surface
Consistency	Firm
Other	Special form: truncus pulmonalis: „paddle embolus” While organizing the embolus becomes attached to the vessel wall (the recent embolus is not attached) Recanalisation may take place during organization
Microscopy	
1.	Layers from RBCs and fibrin
2.	Capillarisation from the vessel wall, macrophages, hemosiderin

Macroscopy



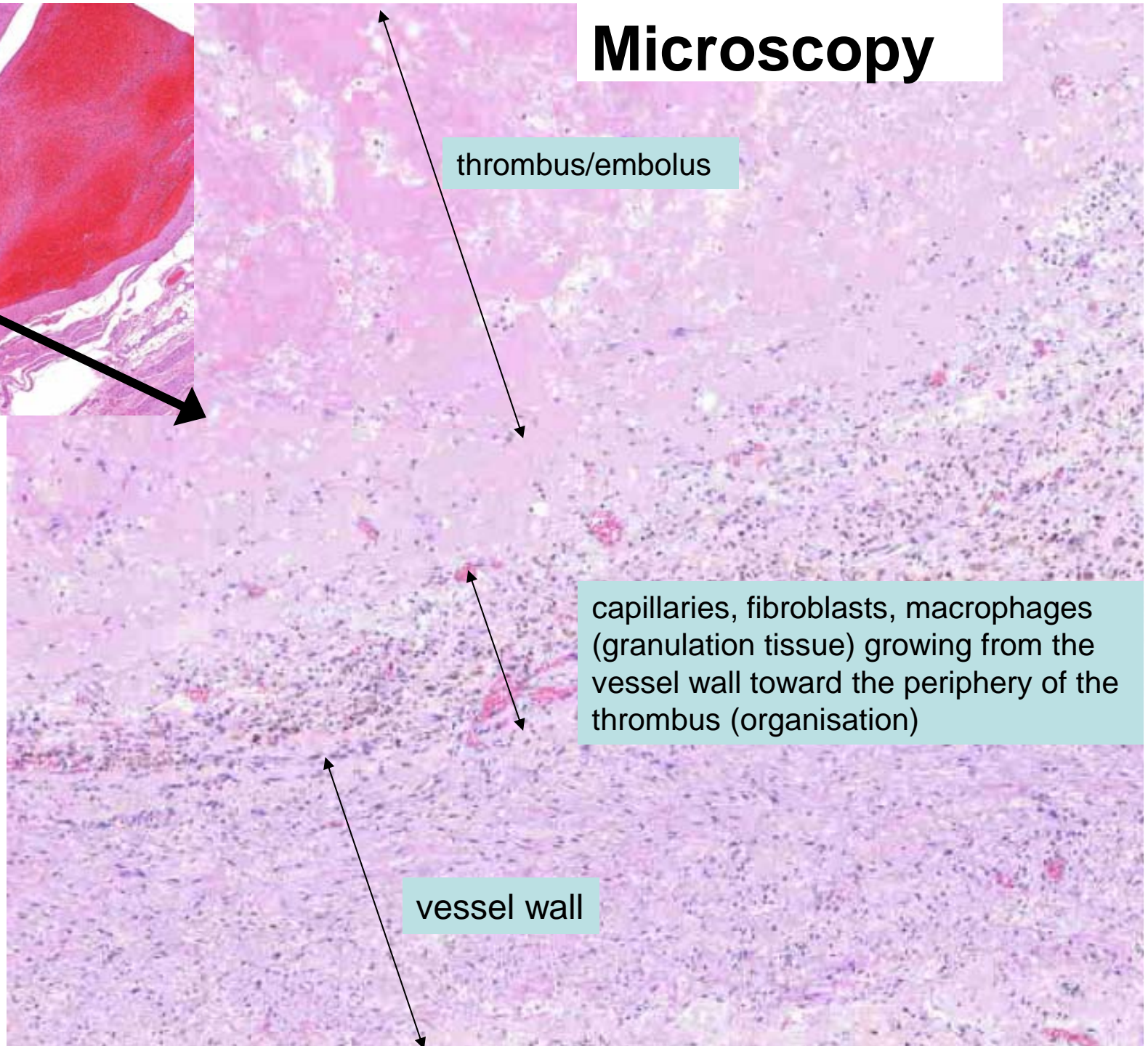
Microscopy



thrombus/embolus

capillaries, fibroblasts, macrophages
(granulation tissue) growing from the
vessel wall toward the periphery of the
thrombus (organisation)

vessel wall

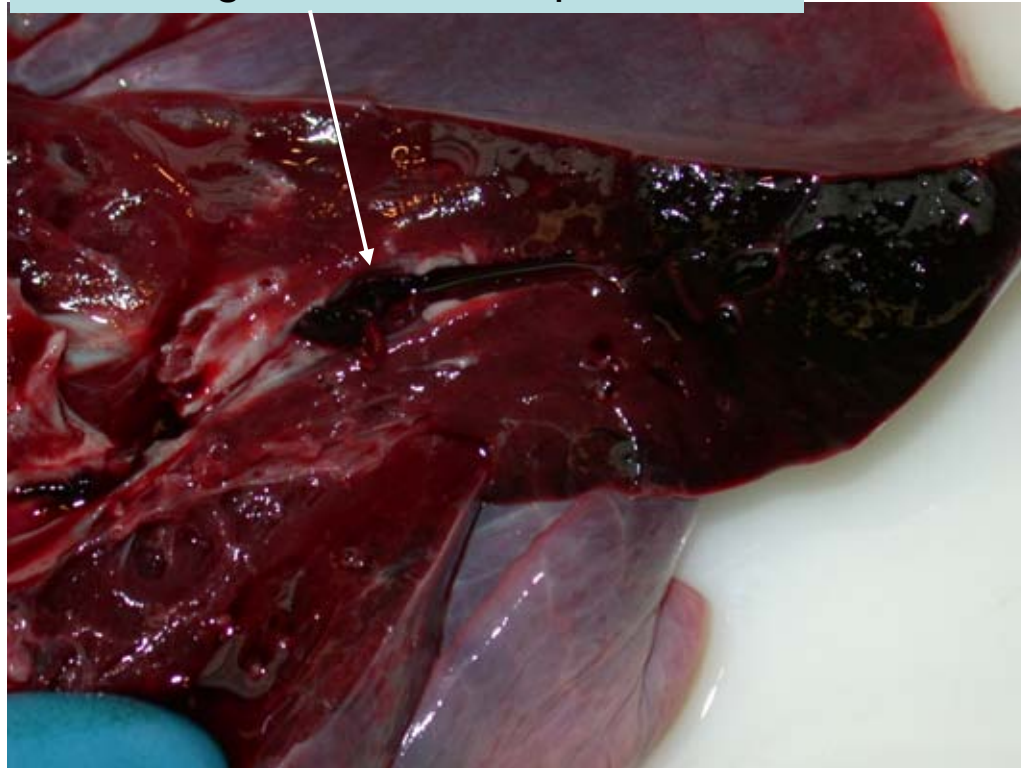


Hemorrhagic infarction of the lung

Macroscopy	
Localisation	Focal – always at the periphery
Pattern	Homogenous, sharply circumscribed, wedge shape – the base is on the pleura
Colour	Dark red
Consistency	Firm
Other	Focal fibrinous pleuritis may accompany
Microscopy	
1.	Sharply circumscribed hemorrhagic area
2.	Alveolar structures disappear

Macroscopy

Occluding embolus in a. pulmonalis

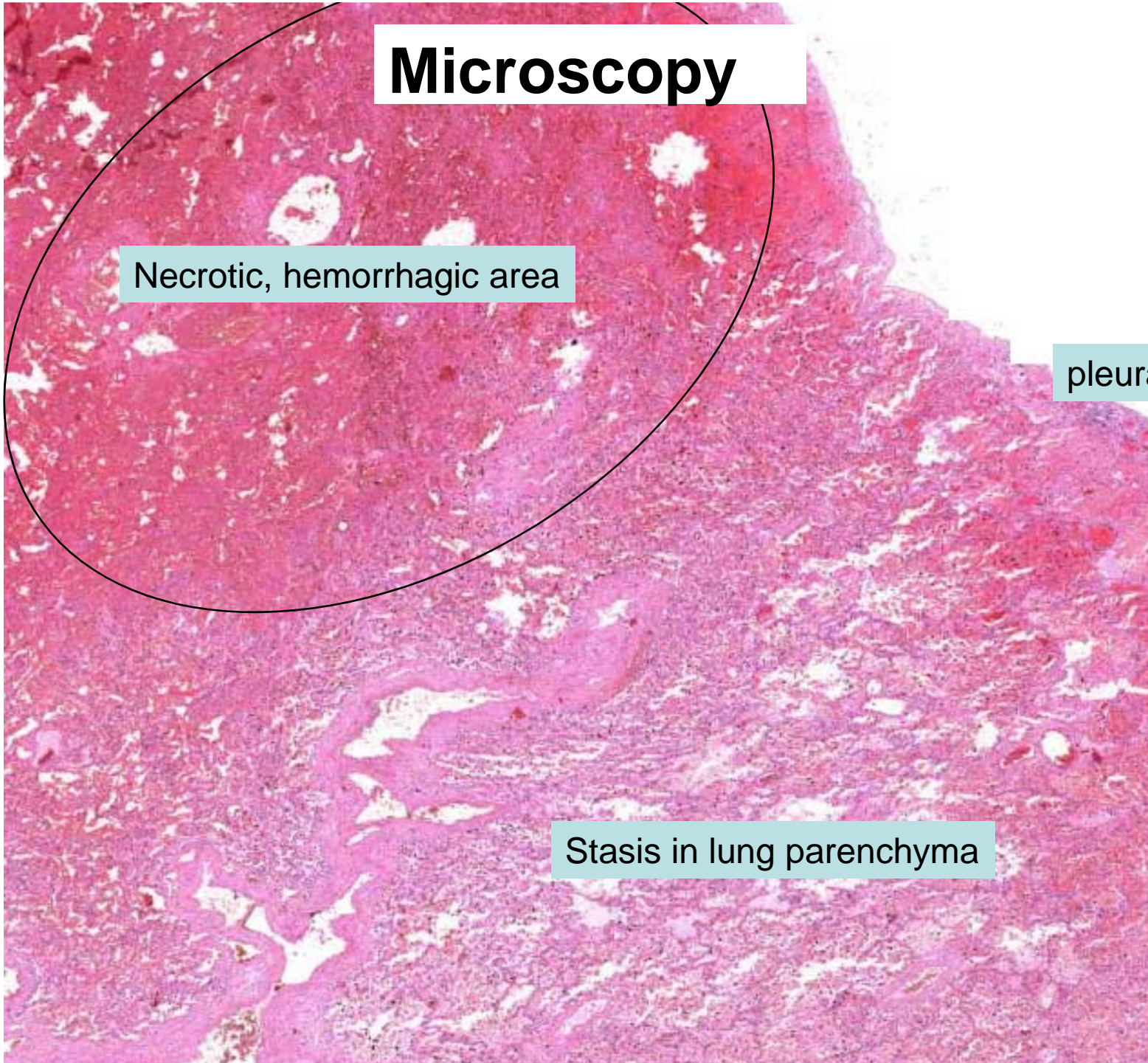


Microscopy

Necrotic, hemorrhagic area

pleura

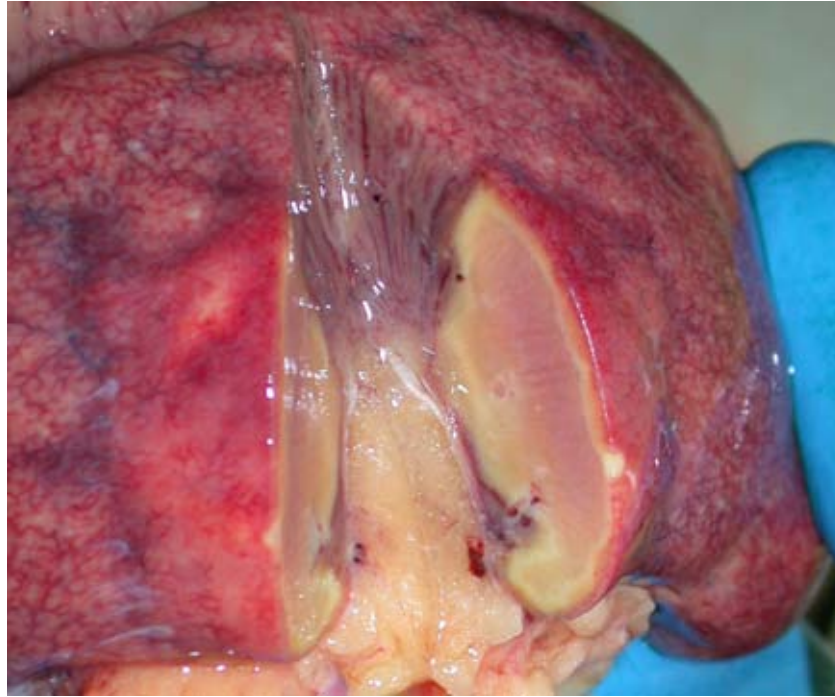
Stasis in lung parenchyma



Anemic infarct of kidney

Macroscopy	
Localisation	Focal – always at the periphery
Pattern	Homogenous, sharply circumscribed, wedge shaped – the base is the kidney capsule
Colour	Clay yellow, with red border
Consistency	Firm
Other	Heals with scar
Microscopy	
1.	Sharply circumscribed coagulation necrosis=eosinophilic shade of the original structures and cells without nuclear staining
2.	Granulocytic infiltration at the edge
3.	Hemorrhagic/hyperemic layer in the surrounding parenchyma

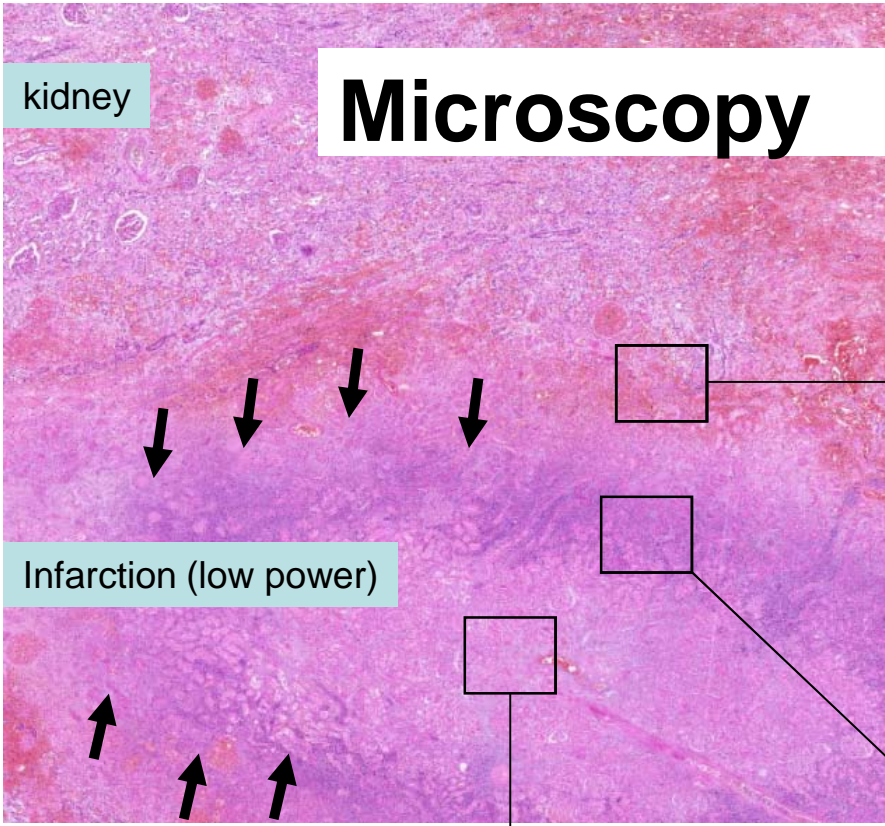
Macrosocopy



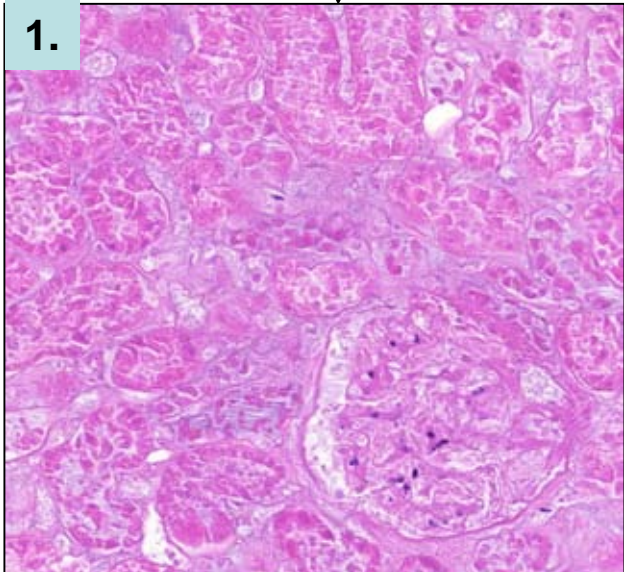
kidney

Microscopy

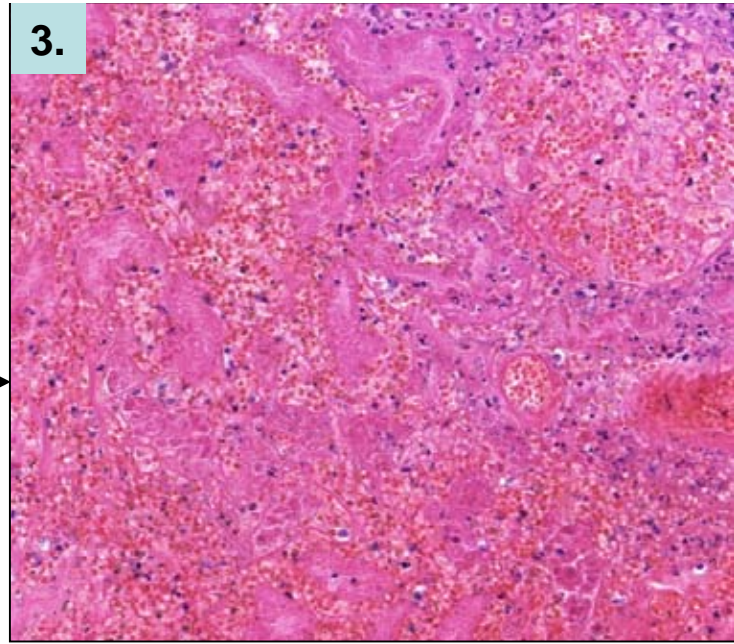
Infarction (low power)



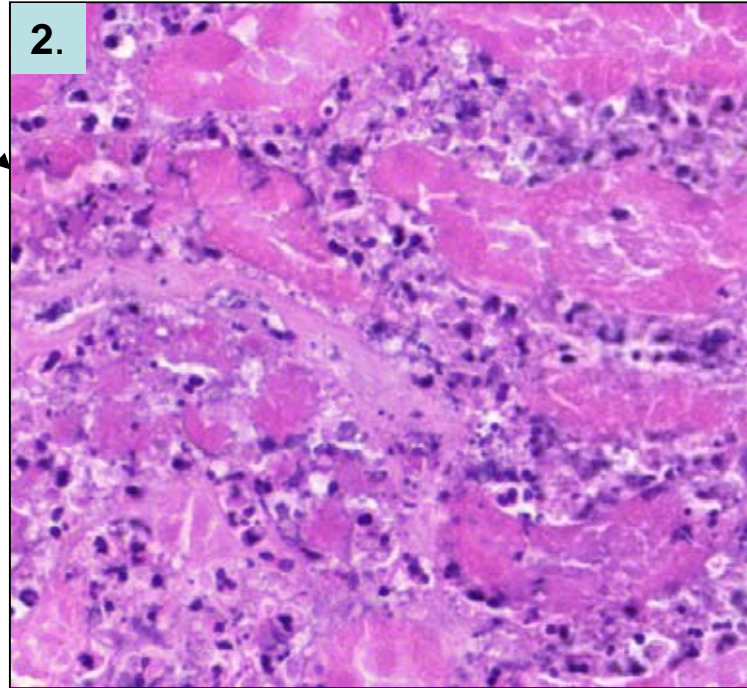
1.



3.



2.



Acute phlegmonous appendicitis

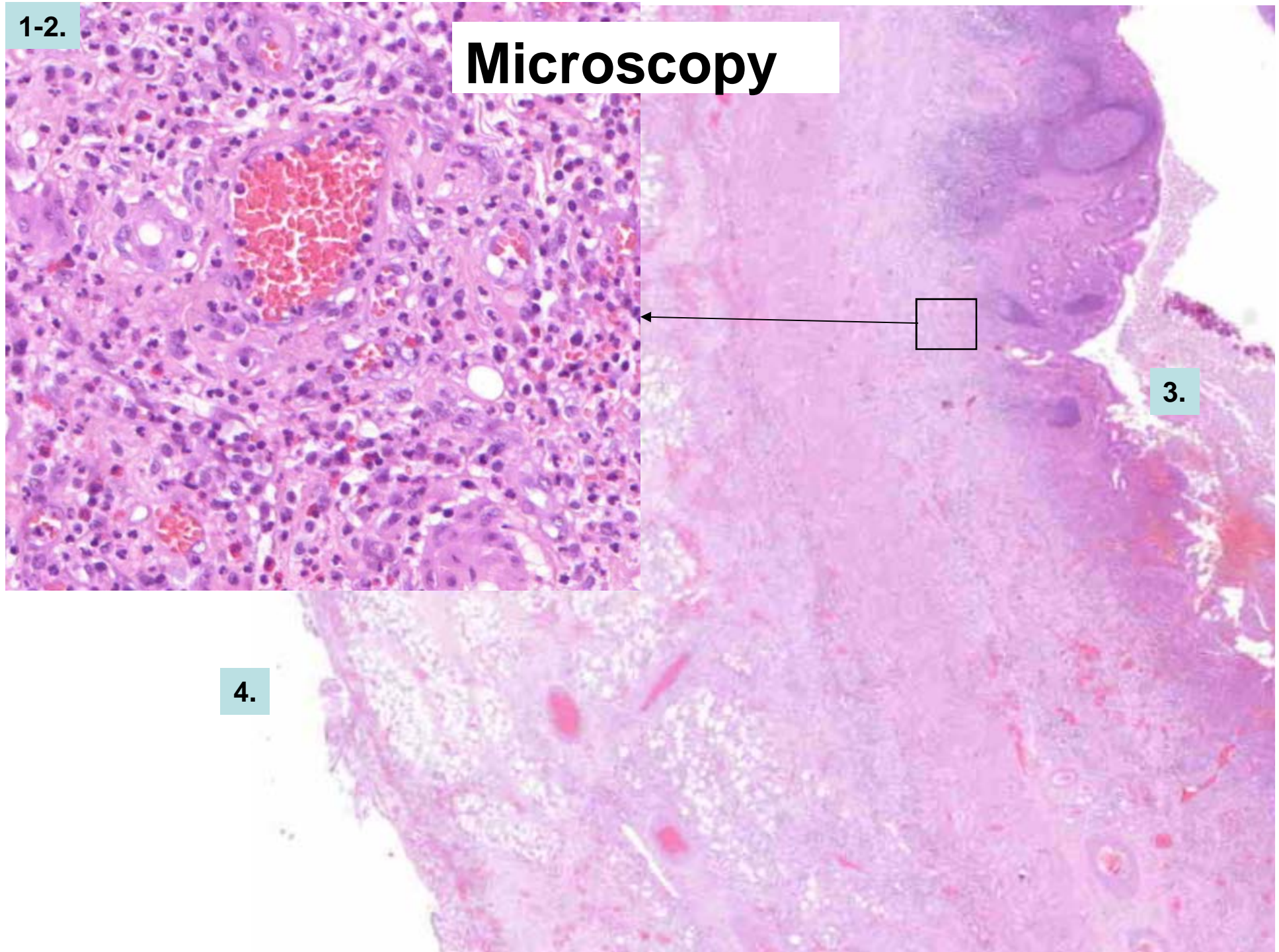
Macroscopy	
Localisation	Phlegmonous inflammation affecting the layers of the wall
Pattern	Diffuse
Colour	Red (hyperemia), yellowish (pus)
Consistency	Soft, edematous
Other	Fibrinous, yellowish-gray exudate on the serosal surface
Microscopy	
1.	Masses of granulocytes in all layers of the appendix
2.	Vasodilatation and edema
3.	Exulceration of the mucosa
4.	Fibrin (eosinophilic) on the serosal surface

Macrosocopy



1-2.

Microscopy



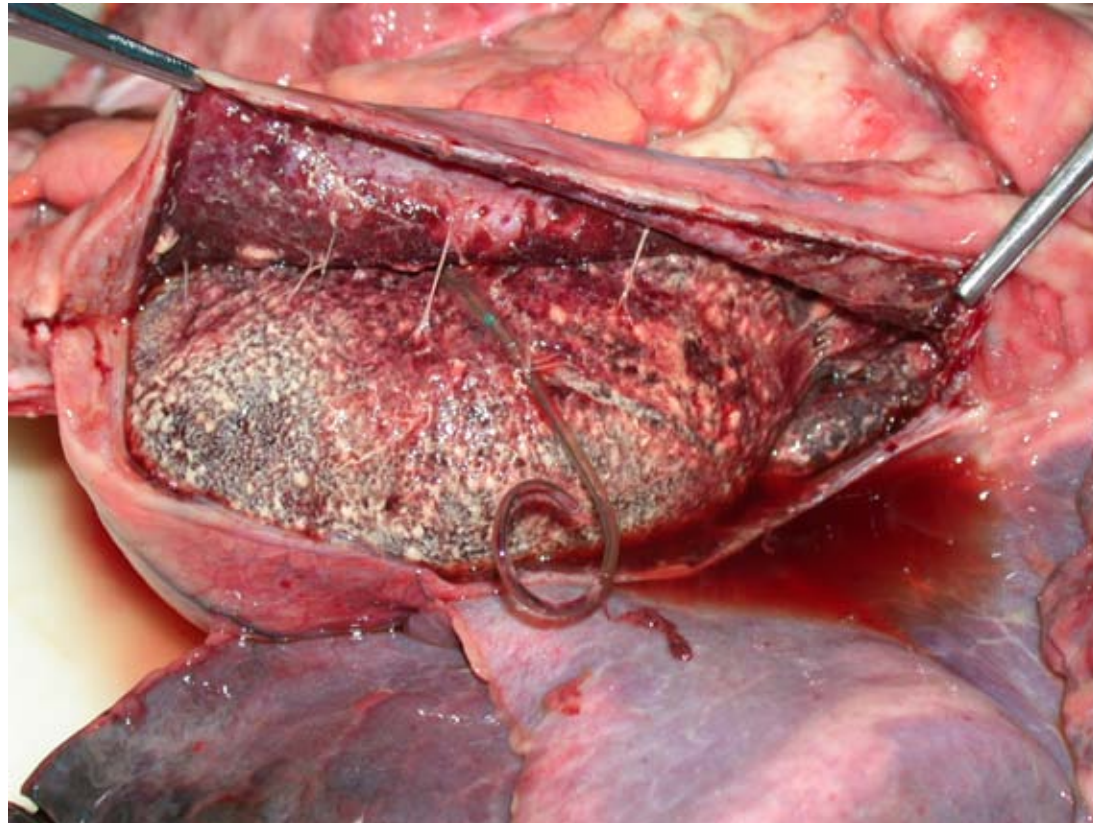
3.

4.

Fibrinous pericarditis

Macroscopy	
Localisation	Diffuse (uremia) or focal (AMI)
Pattern	Filamentous („bread and butter”pericarditis)
Colour	Greyish-yellow, serosal surface hyperemic
Consistency	Soft exsudate, easy to remove
Other	Heals with scar (adhesive fibrosus pericarditis)
Microscopy	
1.	Eosinophilic material (=fibrin) on the surface of the pericardium
2.	Mild inflammatory cell infiltrate (granulocytes, macrophages)

Macroscopy

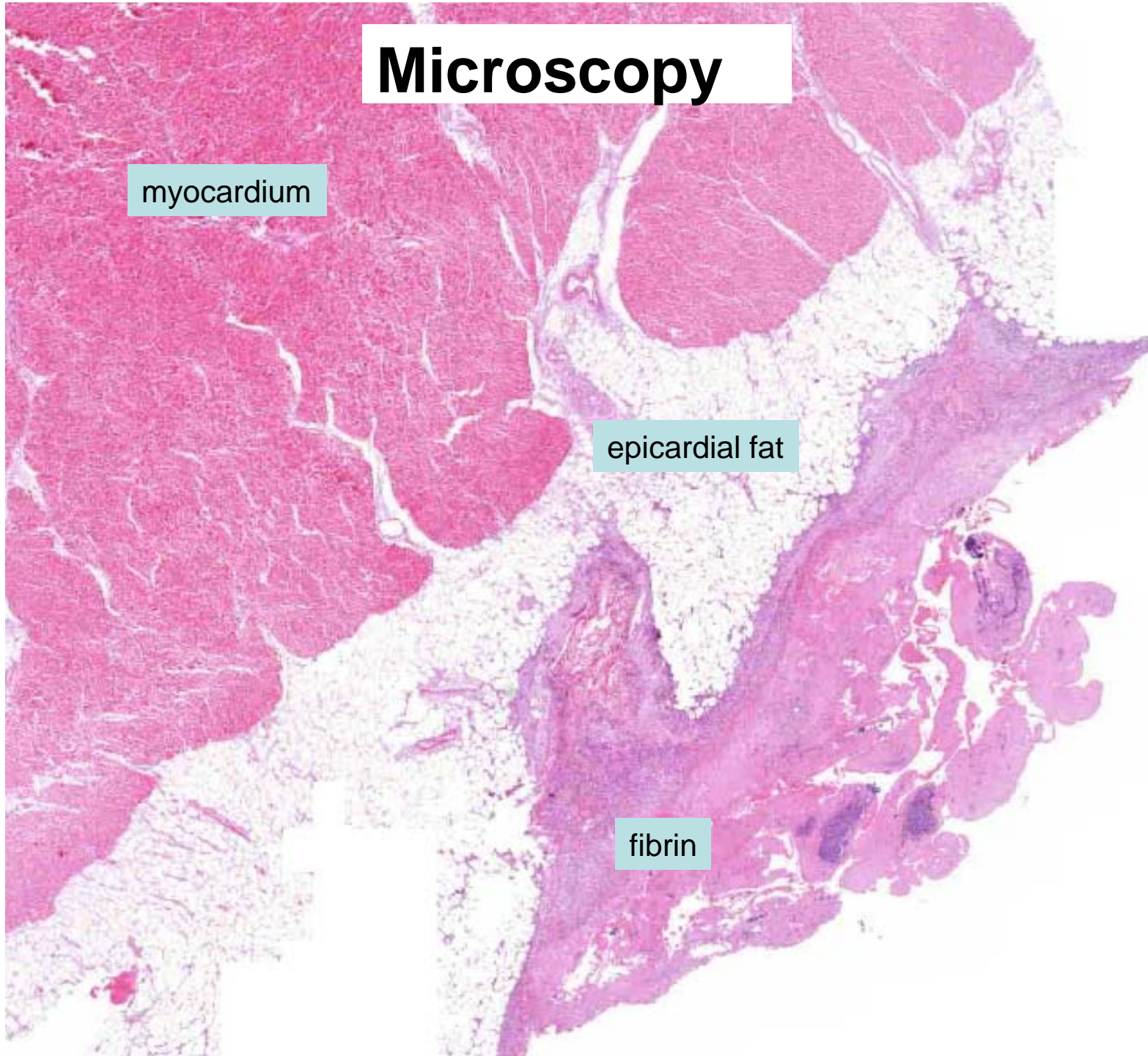


Microscopy

myocardium

epicardial fat

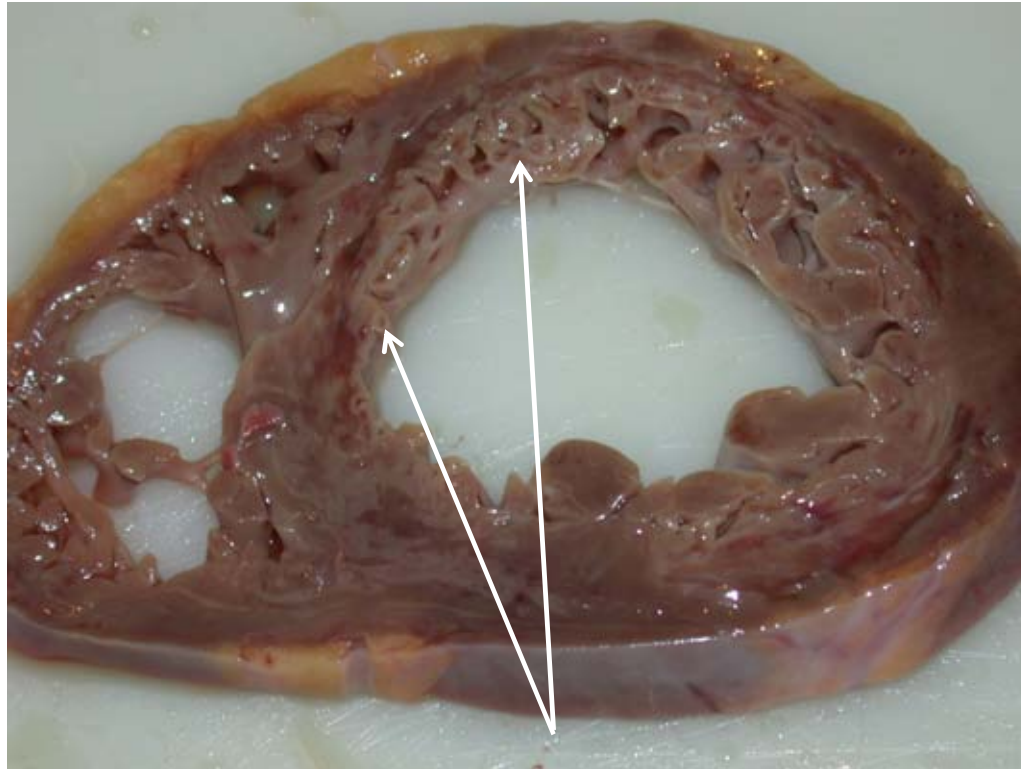
fibrin



Granulation tissue

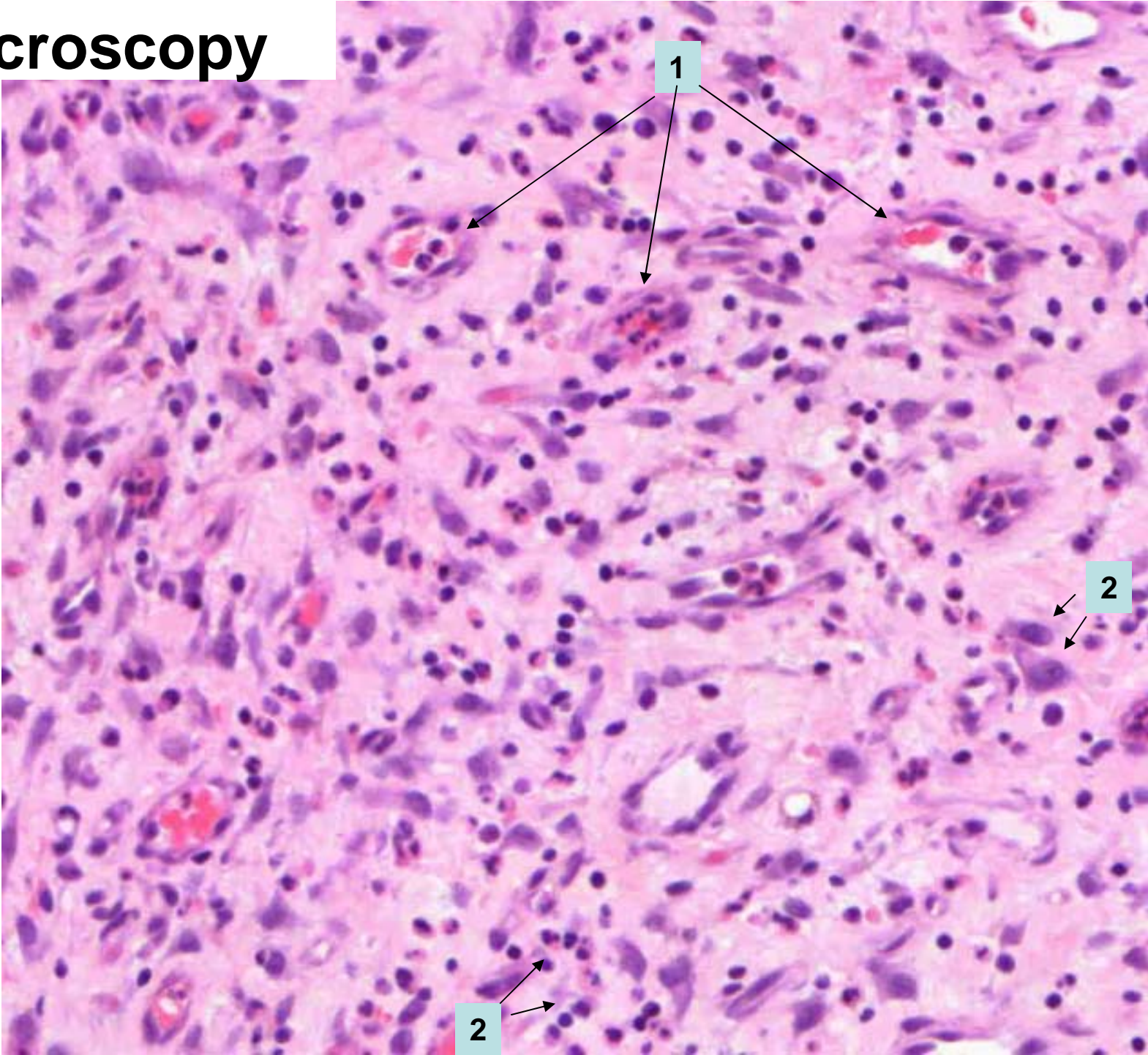
Macroscopy	
Localisation	At sites of any damage to tissues, or organization
Pattern	Depends on provoking agent
Colour	Brownish/greyish, nacreous
Consistency	Soft, rubbery
Other	
Microscopy	
<ol style="list-style-type: none">1. Rich vascularisation (angiogenesis, cuboidal endothelial cells)2. Edematous interstitium, with fibroblasts3. Chronic inflammatory cell infiltrate (macrophages, lymphocytes), in recent granulation tissue granulocytes as well	

Macroscopy



Myocardial infarction of 2-3 weeks: granulation tissue at the site of infarction

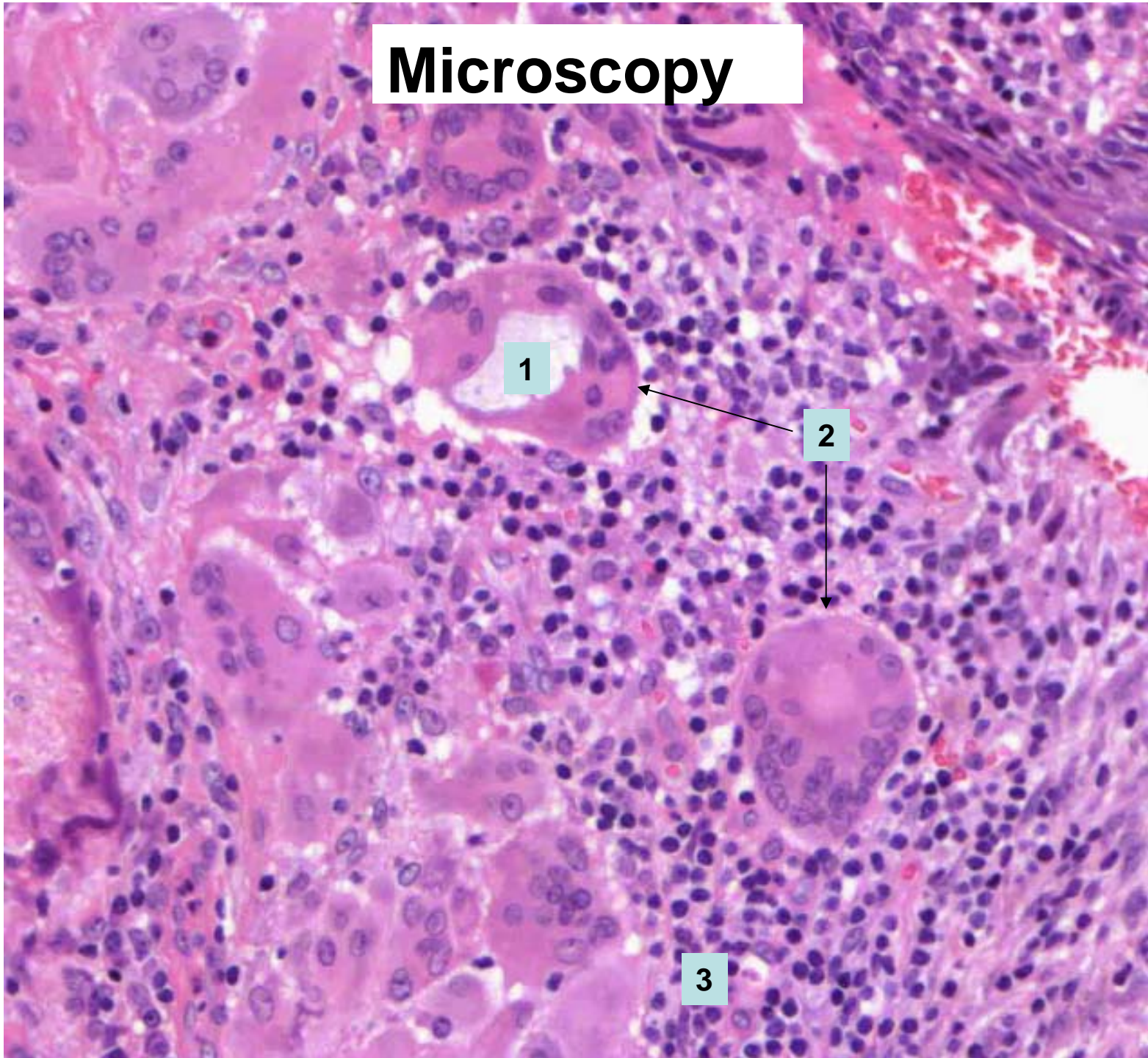
Microscopy



Foreign body granuloma

Macroscopy	
Localisation	Small nodule around foreign bodies within tissues
Pattern	Focal
Colour	Greyish
Consistency	Firm
Other	May be exogenous (suture, spike) or endogenous (keratin)
Microscopy	
1.	Fragments of the foreign body (exogenous material is usually achromatic, may show birefringence in polarized light)
2.	Foreign body giant cells (large number of randomly distributed nuclei in the cytoplasm), epithelioid histiocytes
3.	Fibrosis, lymphocytes in the surrounding tissue

Microscopy

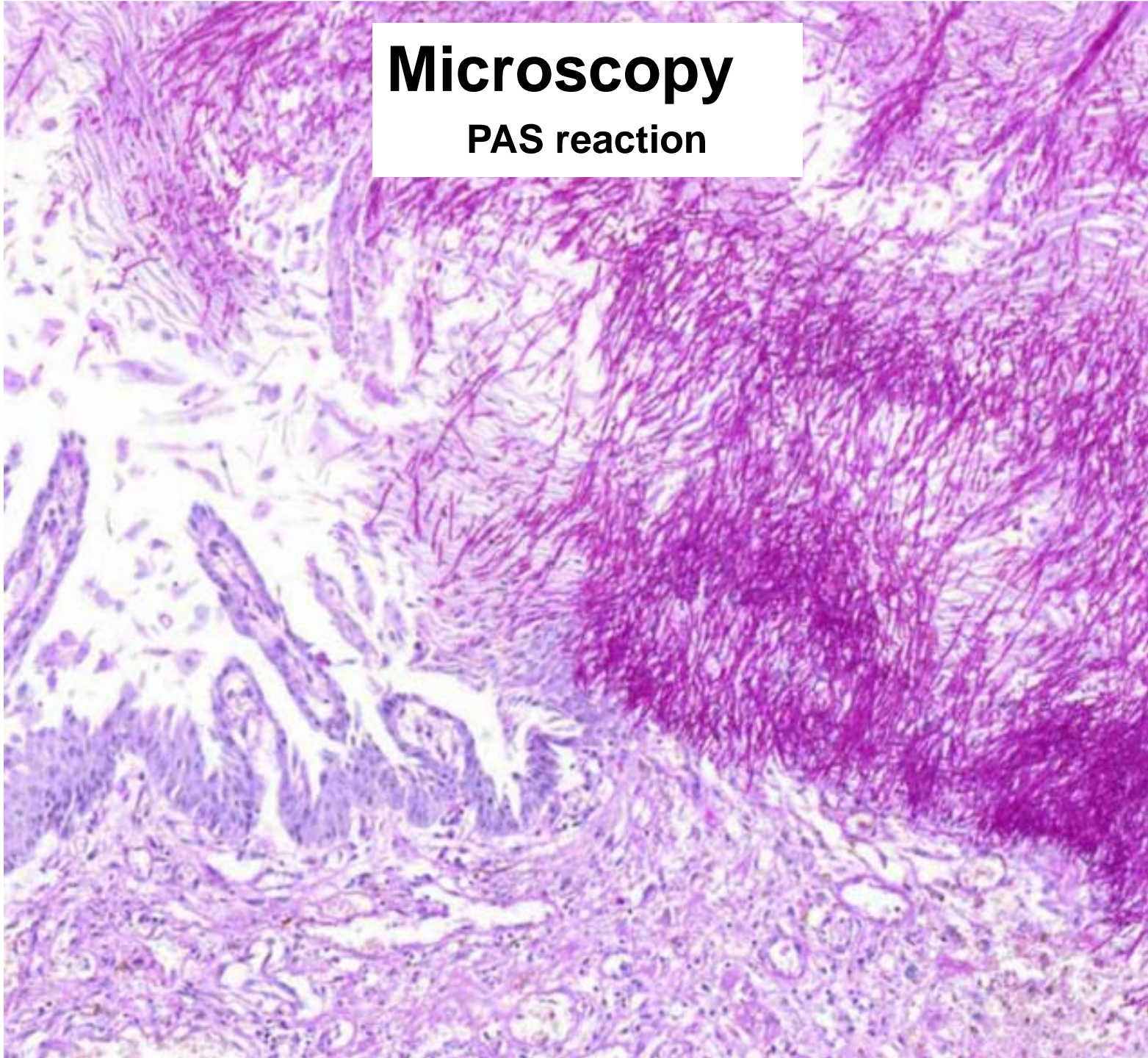


Candidiasis

Macroscopy	
Localisation	Superficial: on mucosal surfaces Deep (parenchymal): kidney, liver etc.
Pattern	Superficial: membrane-like Deep: abscess formation
Colour	Greyish-white
Consistency	Soft, easily removable membrane
Other	
Microscopy	
1.	Ulcerated epithelial surface
2.	PAS-positive (purple) Candida hyphae
3.	Granulocytes

Microscopy

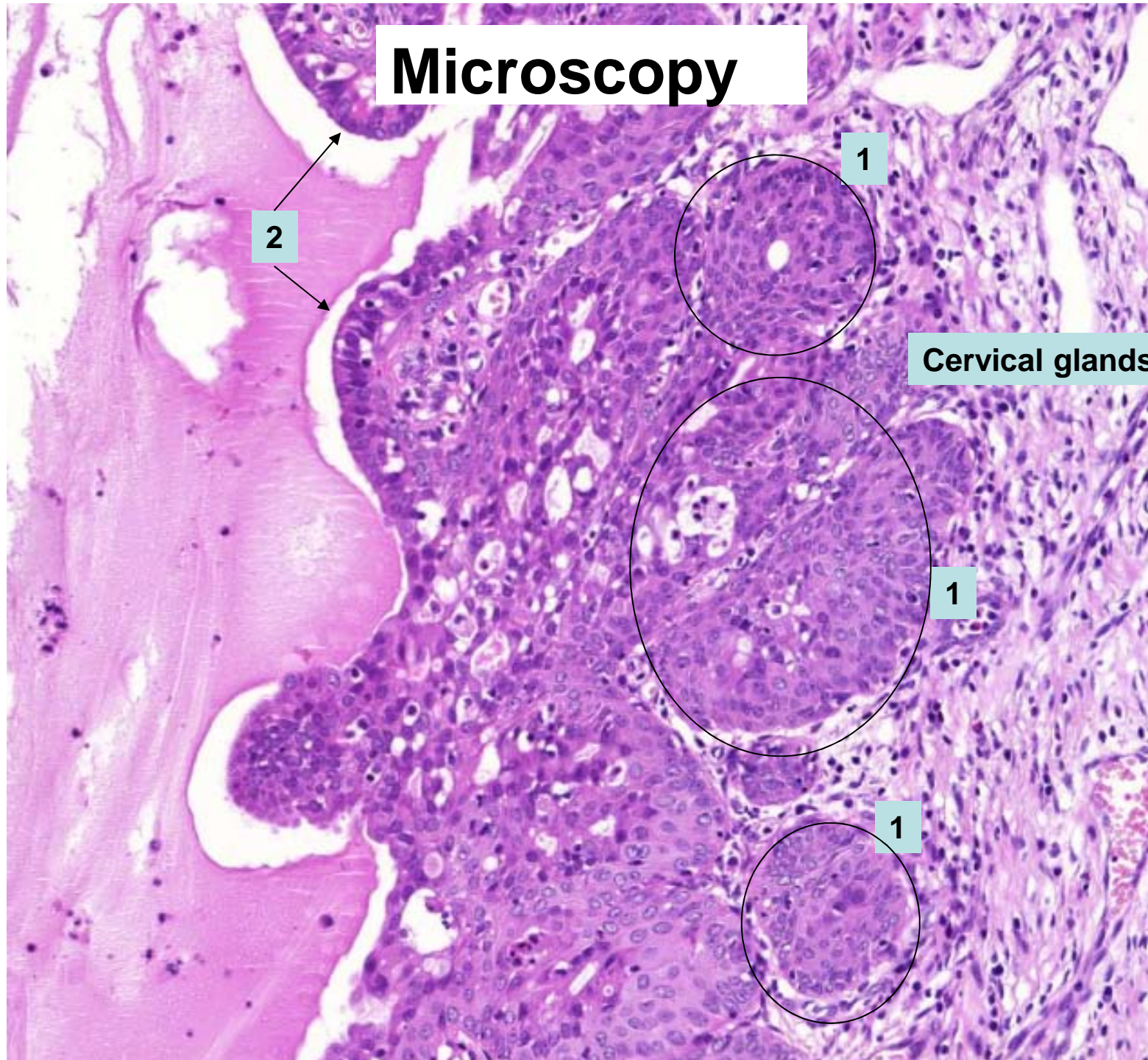
PAS reaction



Squamous metaplasia in uterine cervix

Macroscopy	
Localisation	
Pattern	
Colour	white
Consistency	
Other	Colposcopy: „leukoplakia”
Microscopy	
<ol style="list-style-type: none">1. Mature squamous epithelium in the cervix, also in cervical glands2. On the surface mucin producing epithelium3. NOT PRECANCEROUS LESION!	

Microscopy



2

1

Cervical glands

1

1

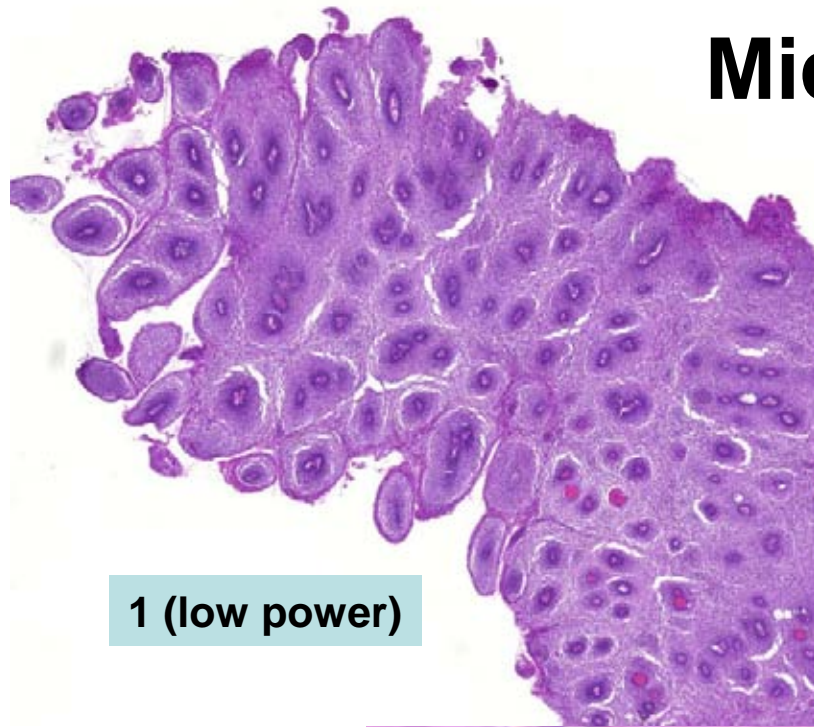
Condyloma acuminatum – HPV infection

Macroscopy	
Localisation	Anogenital region, low-risk HPV associated benign tumor of squamous epithelium
Pattern	Solitary or often multiple exophytic growth of mm-cm size
Colour	Gray
Consistency	Rubbery-firm
Other	
Microscopy	
1.	Papillary neoplasm, orderly squamous epithelium, parakeratosis may occur
2.	In the middle layer of the epithelium pycnotic cells are present with a clear perinuclear halo = koilocytes (squamous epithelial cells infected with HPV)
3.	Dysplasia may develop (due to high risk HPV superinfection)

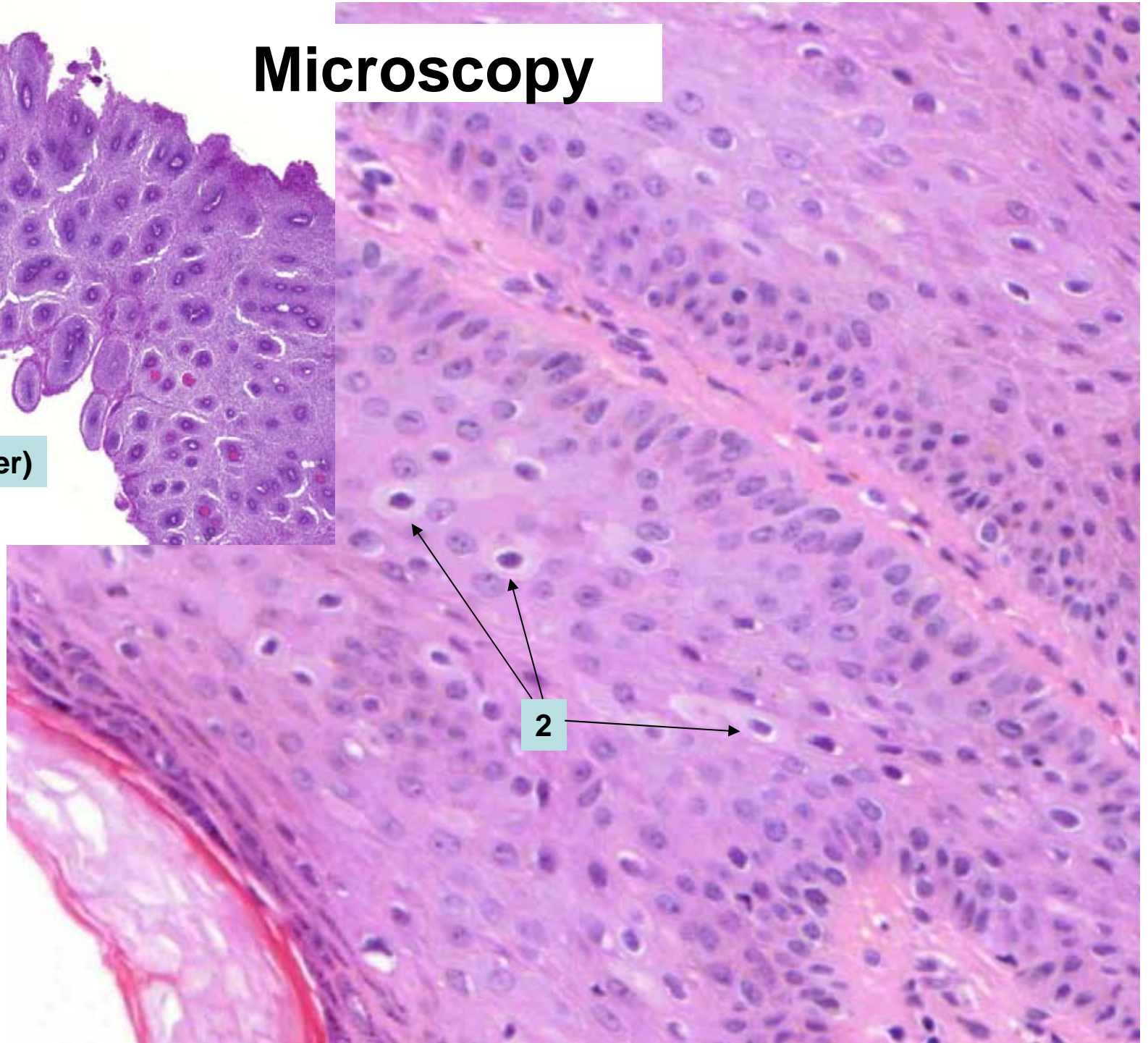
Macroscopy



Microscopy



1 (low power)



2

CIN3 - HSIL

Macroscopy

Localisation	Cervix squamo-columnar junction, hardly visible by naked eye, usually of few mm extent
Pattern	Focal, affects rarely the whole ectocervix, may spread to the endocervix
Colour	Greyish-white (leukoplakia)
Consistency	
Other	Decreased glycogen content of the cells – following iodine brushing colposcopy shows a pale area

Microscopy

1. Sharply circumscribed from the surrounding epithelium. May spread to glands
2. In the dysplastic epithelium there are loss of orientation, atypical cells with hyperchromatic nuclei, mitotic figures (atypical mitoses also)
3. Basal membrane intact
4. Chronic inflammatory cell infiltrate in the stroma

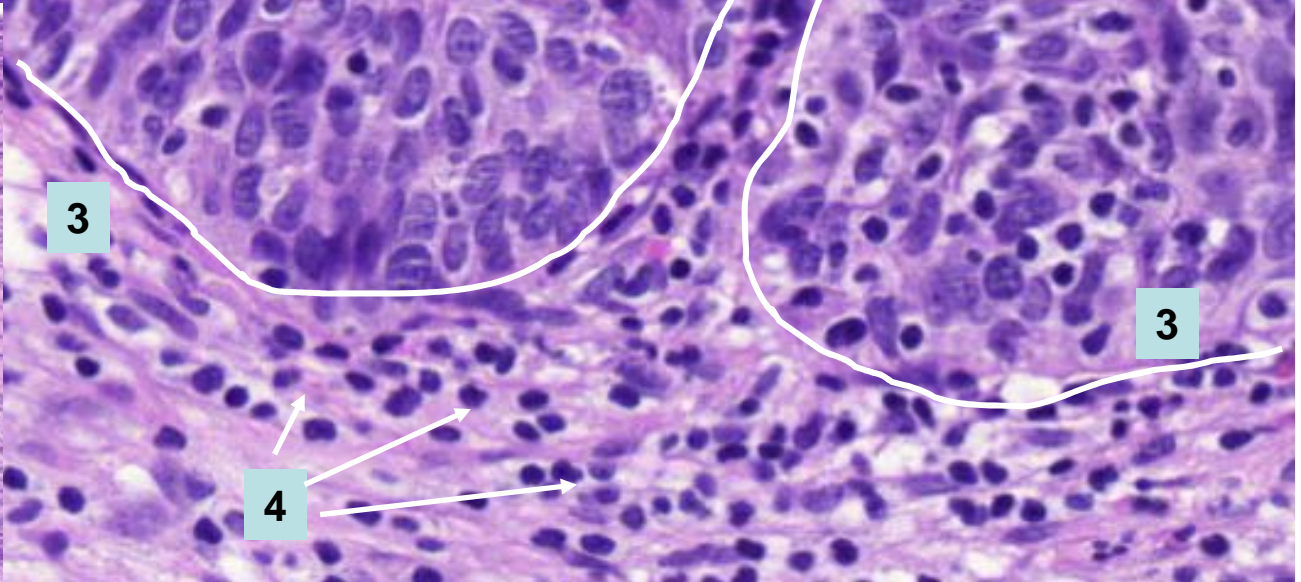
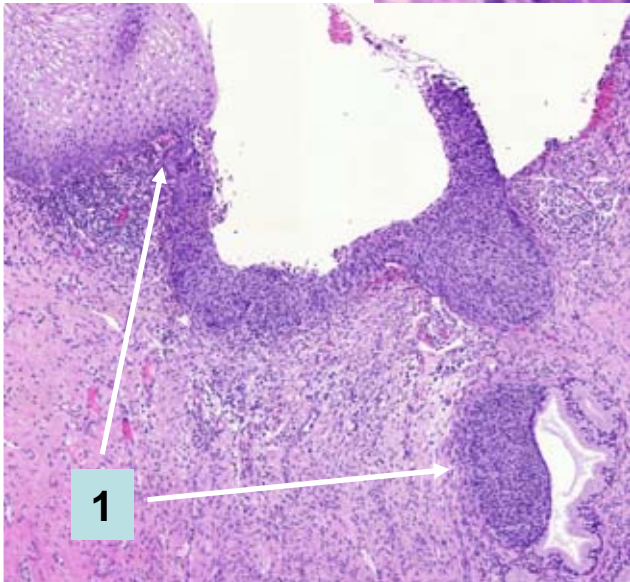
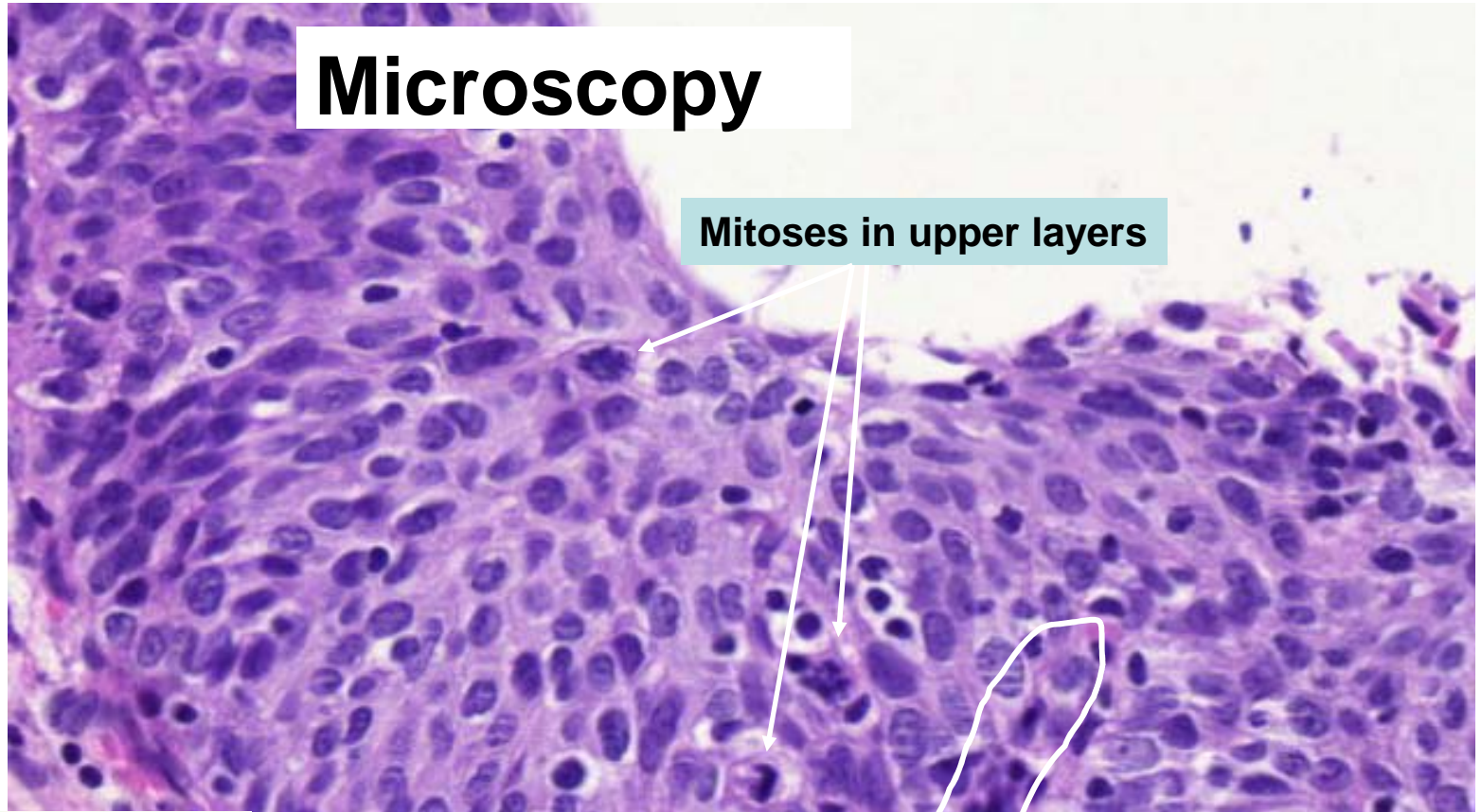
Macroscopy



Source:<http://prevencio.sote.hu/tartalom.php?action=almenu&id=33>

Microscopy

Mitoses in upper layers



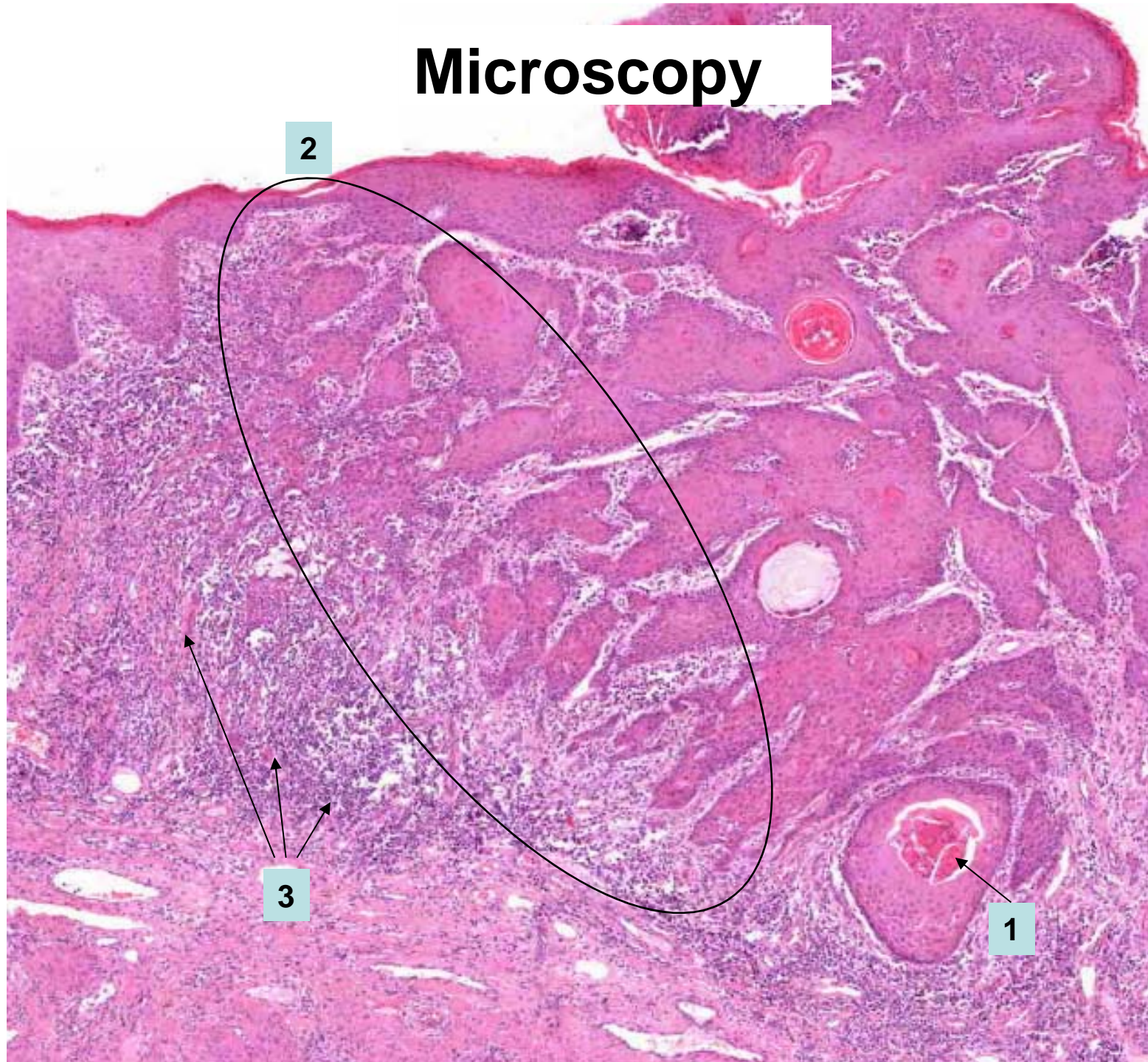
Carcinoma planocellulare cervicis uteri

Macroscopy	
Localisation	Originates from the exocervix. In some cases endocervical localisation, in such cases it is not seen on colposcopy.
Pattern	Focal tumor, exophytic, ulceration, poorly circumscribed edge at the deep portion
Colour	Greyish
Consistency	Usually firm
Other	Regional metastases in the pelvic (sometime in the presacral) lymph nodes
Microscopy	
<ol style="list-style-type: none">1. Variable pleomorphism of the squamoid cells, keratinization may occur2. Infiltrative pattern, non-organoid nested tumor cells3. Desmoplasia, variable lymphocytic infiltrate	

Macroscopy



Microscopy



Papilloma planocellulare

Macroscopy	
Localisation	Mucosal surface (squamous epithelium) (mouth, pharynx, larynx-vocal cord) benign tumor, HPV associated
Pattern	Solitary; often multiple (=papillomatosis). Exophytic, polypoid growth of mm-cm size
Colour	Greyish
Consistency	Usually firm
Other	Dysplasia rarely develops
Microscopy	
Arborizing fibrovascular stalks covered with multilayered squamous epithelium, koilocytes may be present	

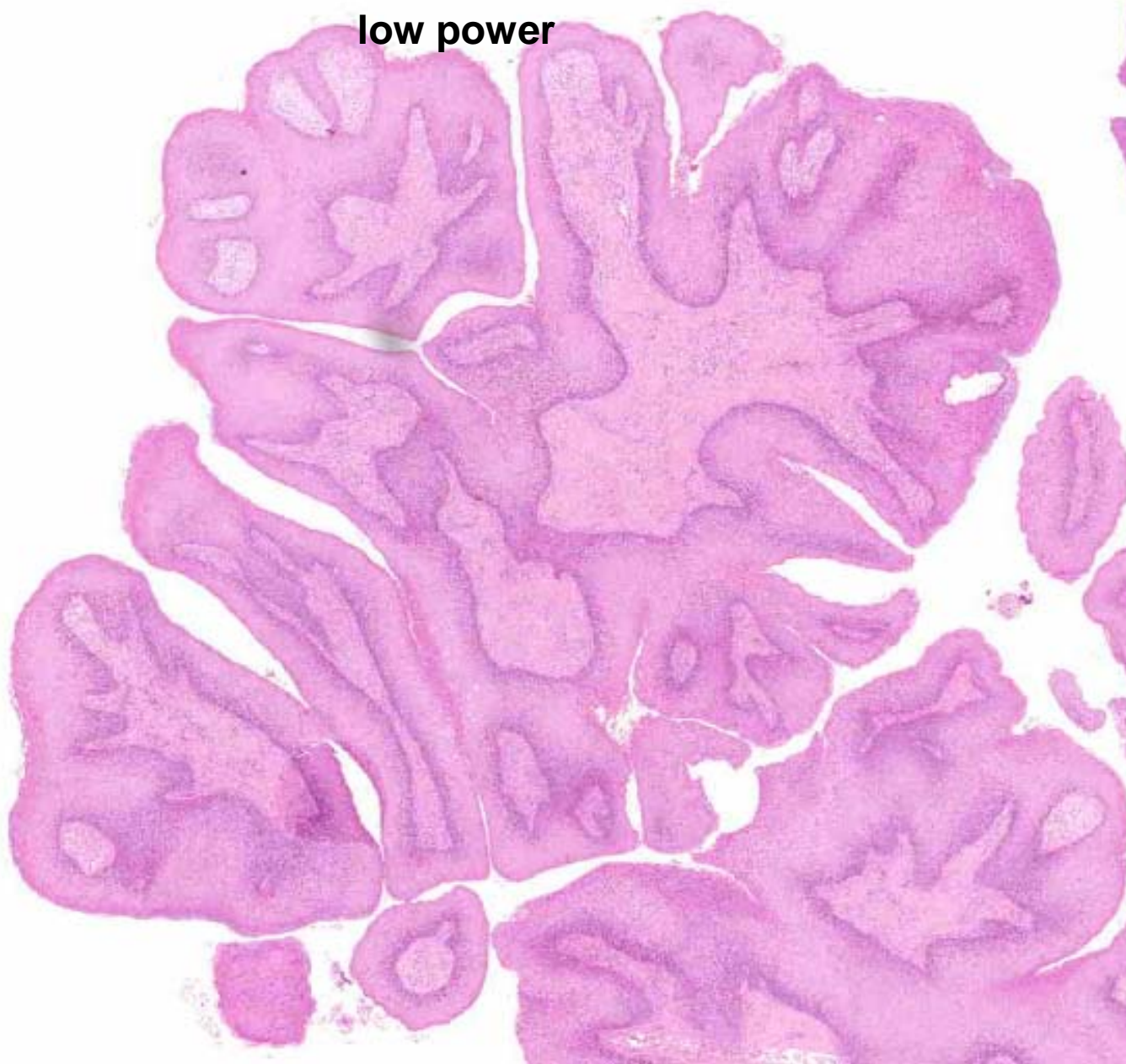
Macroscopy



Vocal cord papilloma: laryngoscopic appearance

Microscopy -

low power



Carcinoma planocellulare laryngis (Laryngeal squamous cell carcinoma)

Macroscopy	
Localisation	Usually affects vocal cords (=glottic)
Pattern	Solitary. Exophytic or endophytic, ulcerated. Poorly circumscribed deep border
Colour	Greyish
Consistency	Usually firm
Other	Regional metastases: parajugular lymph nodes
Microscopy	
Same as cervix squamous carcinoma	

Macroscopy

(example of an endophytic tumor)



Microscopy

tumor
(exophytic tumor)

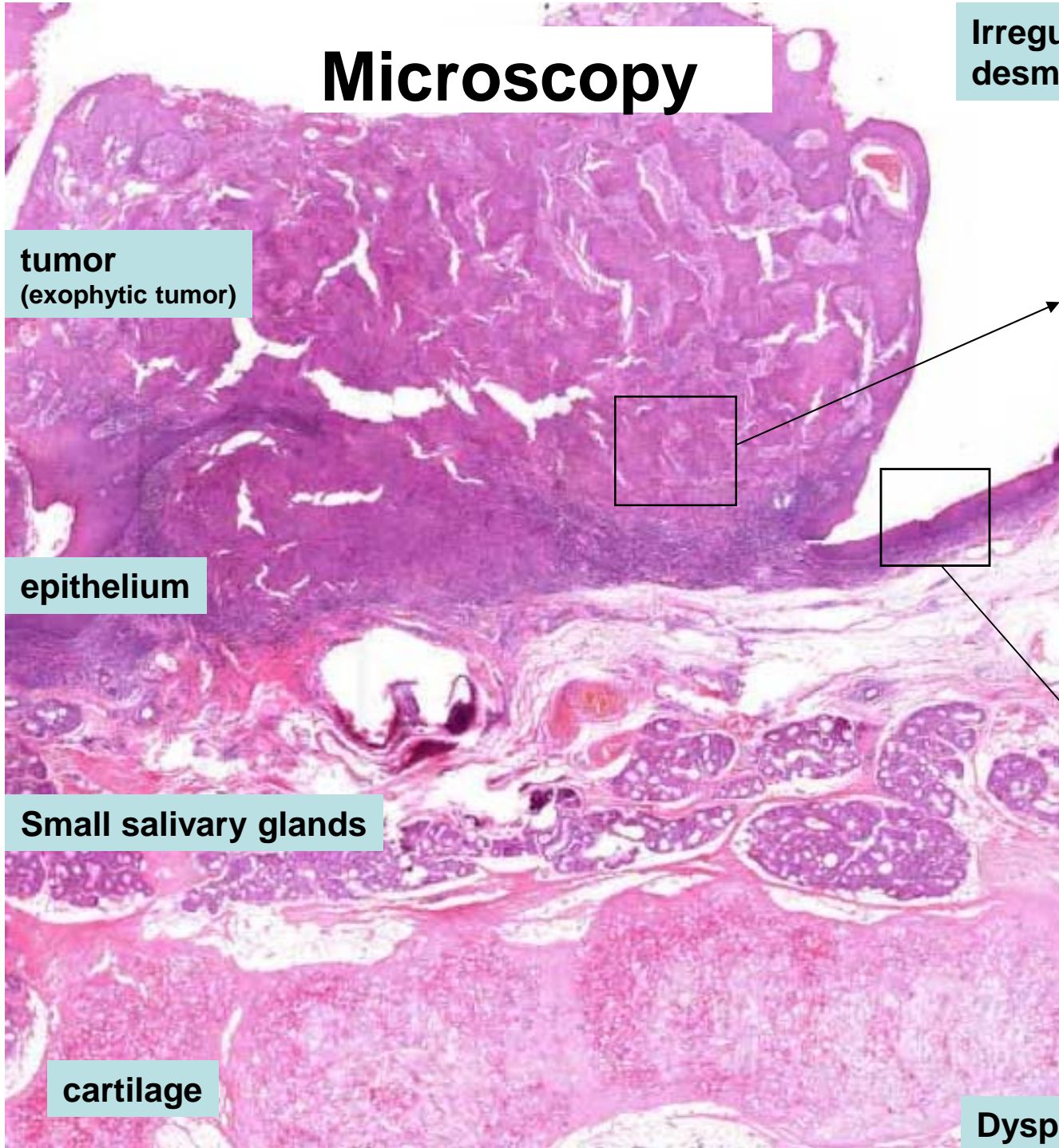
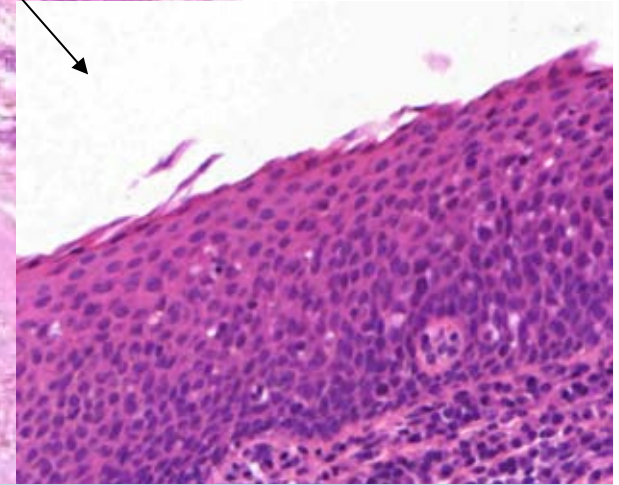
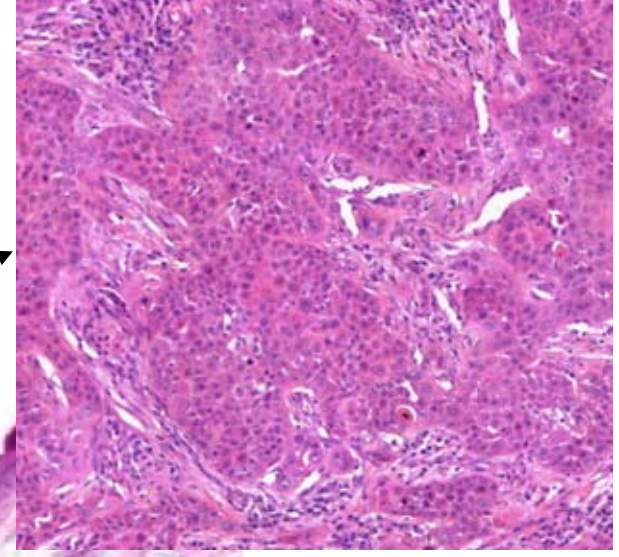
Irregular infiltrative cell nests
desmoplastic neostroma

epithelium

Small salivary glands

cartilage

Dysplasia in surrounding mucosa

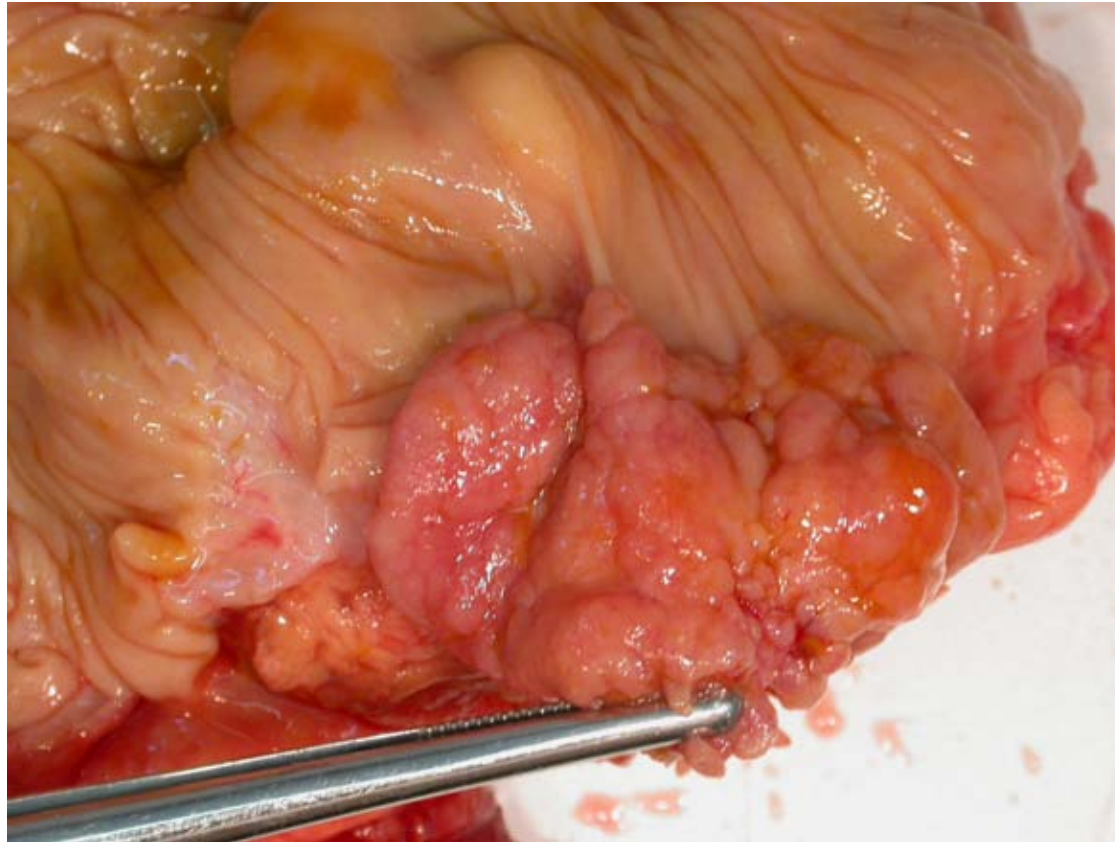


Adenoma tubulovillosum coli

Macroscopy	
Localisation	Colon mucosa
Pattern	Sporadic: solitary or few Familiar: multiple (several hundred). Polypoid (=pedunculated) or broad based (=sessile) growth size: mm-several cm
Colour	Greyish-brown
Consistency	Soft or rubbery
Other	
Microscopy	
<ol style="list-style-type: none">1. Tubular or villous structures (mixed)2. Dysplasia is always present!!!! (mild to moderate atypia=low-grade; severe atypia=high grade) – atypical, pseudostratified columnar epithelium, hyperchromatic nuclei, decreased mucin secretion <p>To note: <i>High grade neoplasia/dysplasia</i> category includes cases with invasion of lamina propria</p>	

Macroscopy

(example of a pedunculated adenomatous polyp)

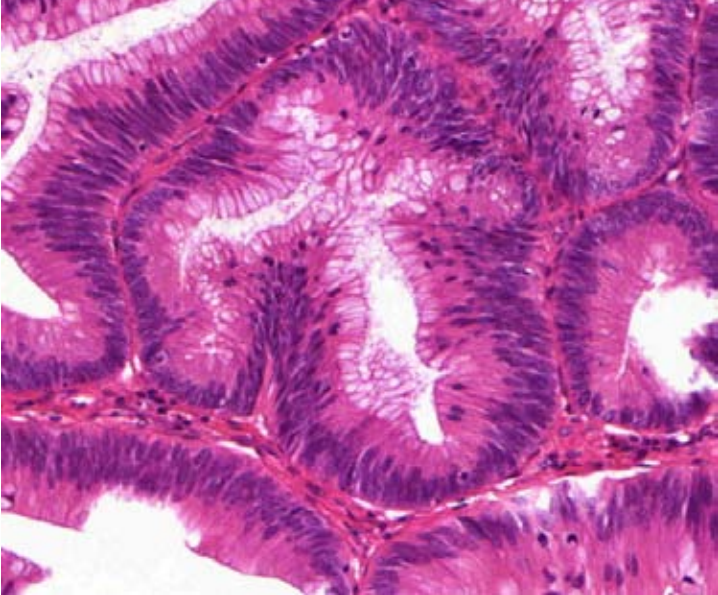


Microscopy

polypoid adenoma



Dysplastic gland (low grade)



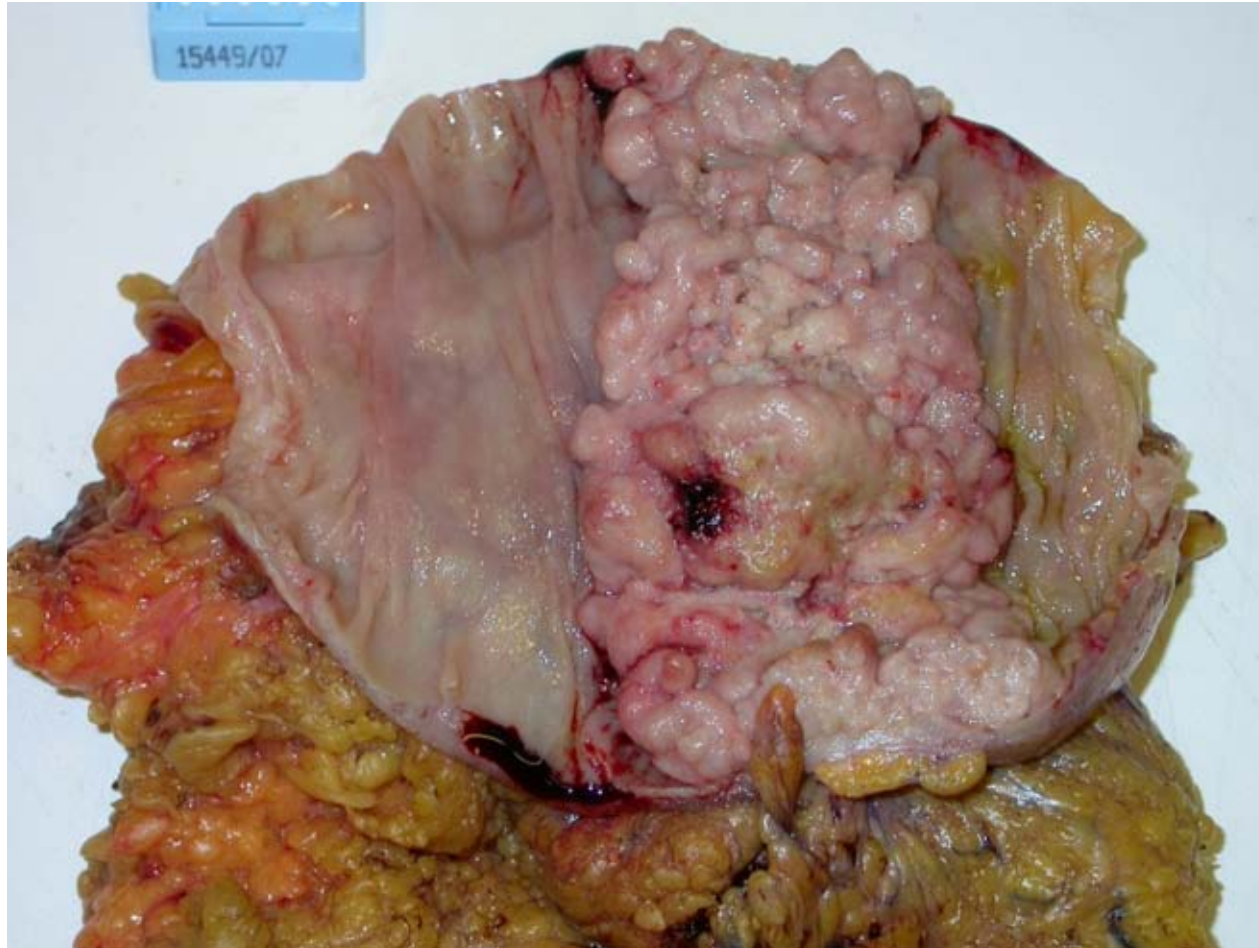
Normal crypts

Colon adenocarcinoma

Macroscopy	
Localisation	Any part of colon (most common: sigma and rectum)
Pattern	Usually solitary. Polypoid (exophytic) or infiltrating (endophytic). Usually exulcerated. Several cm large.
Colour	Greyish
Consistency	Firm
Other	Most commonly begins in an adenoma (=adenoma-carcinoma sequence) May occur „de novo” (HNPCC)
Microscopy	
<ol style="list-style-type: none">1. Atypical, variably polymorphic glandular neoplastic cells2. Infiltrative pattern, atypical glandular structures (in poorly differentiated cases solid-diffuse growth pattern). Lymphatic and venous invasion may be present. Necrosis common.3. Desmoplastic stroma, lymphocytic infiltration	

Macroscopy

(example of an exophytic tumor)



Microscopy

Example of an endophytic tumor

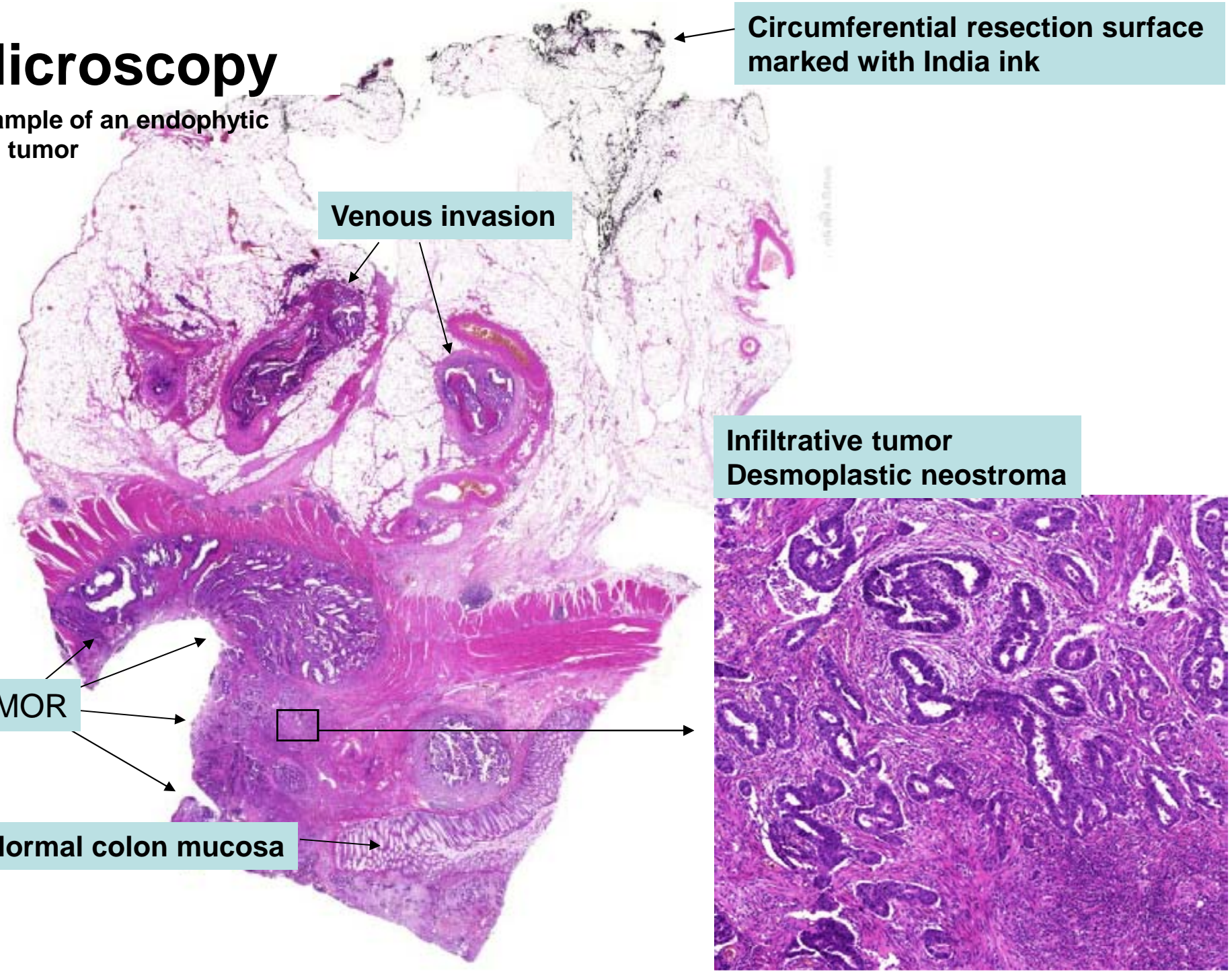
Circumferential resection surface marked with India ink

Venous invasion

Infiltrative tumor
Desmoplastic neostroma

TUMOR

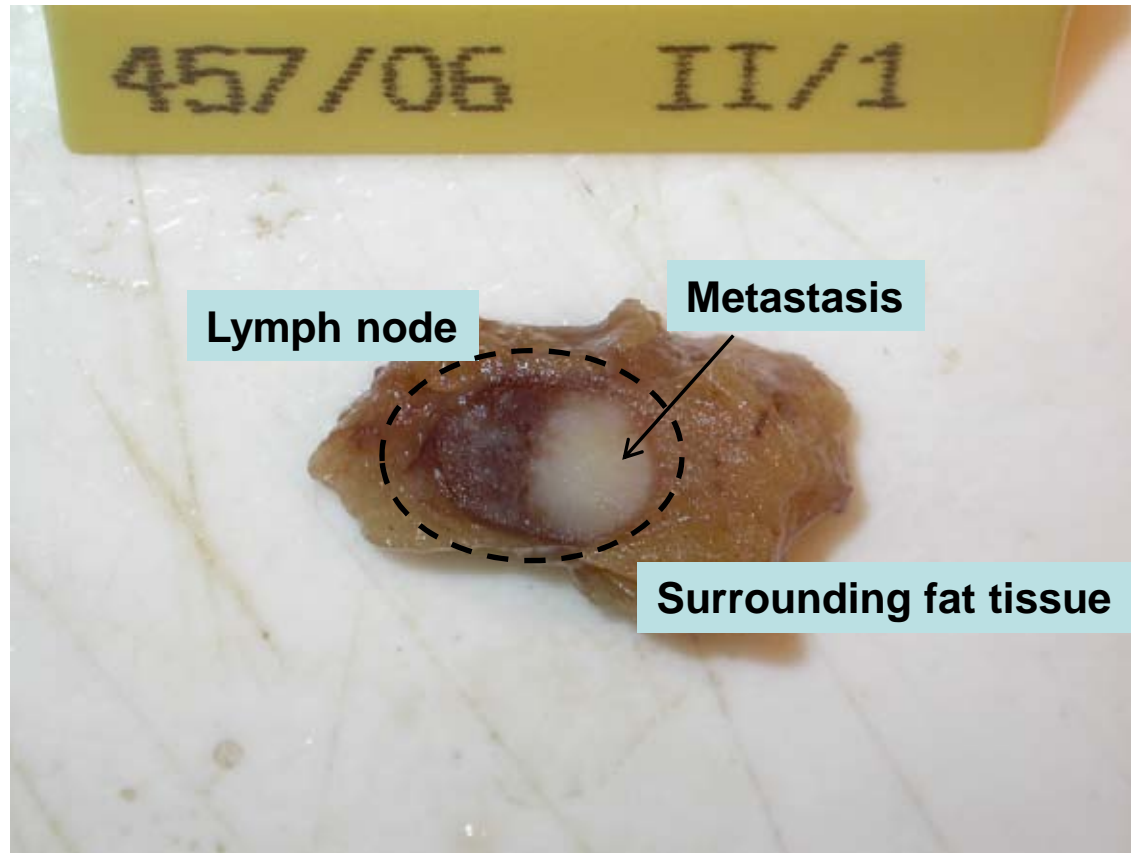
Normal colon mucosa



Squamous cell carcinoma metastasis in a lymph node

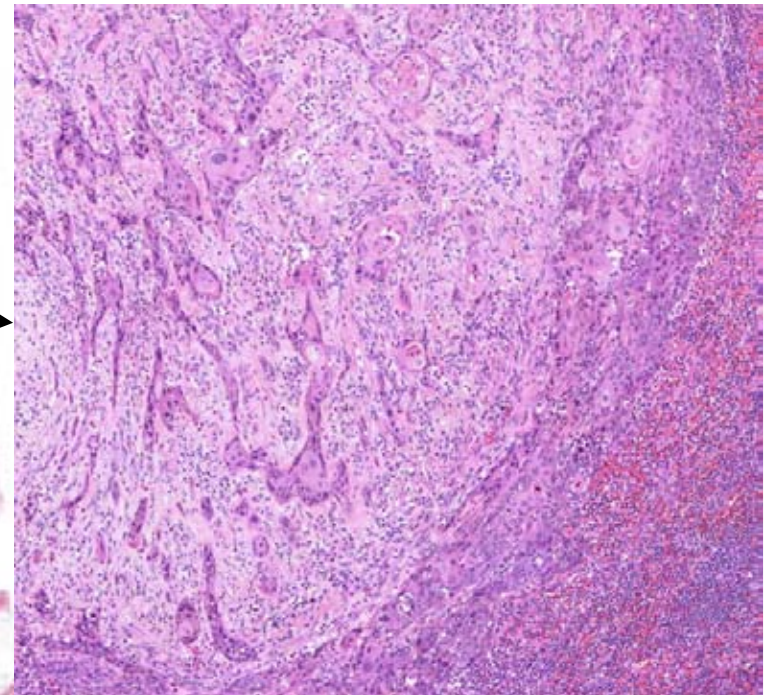
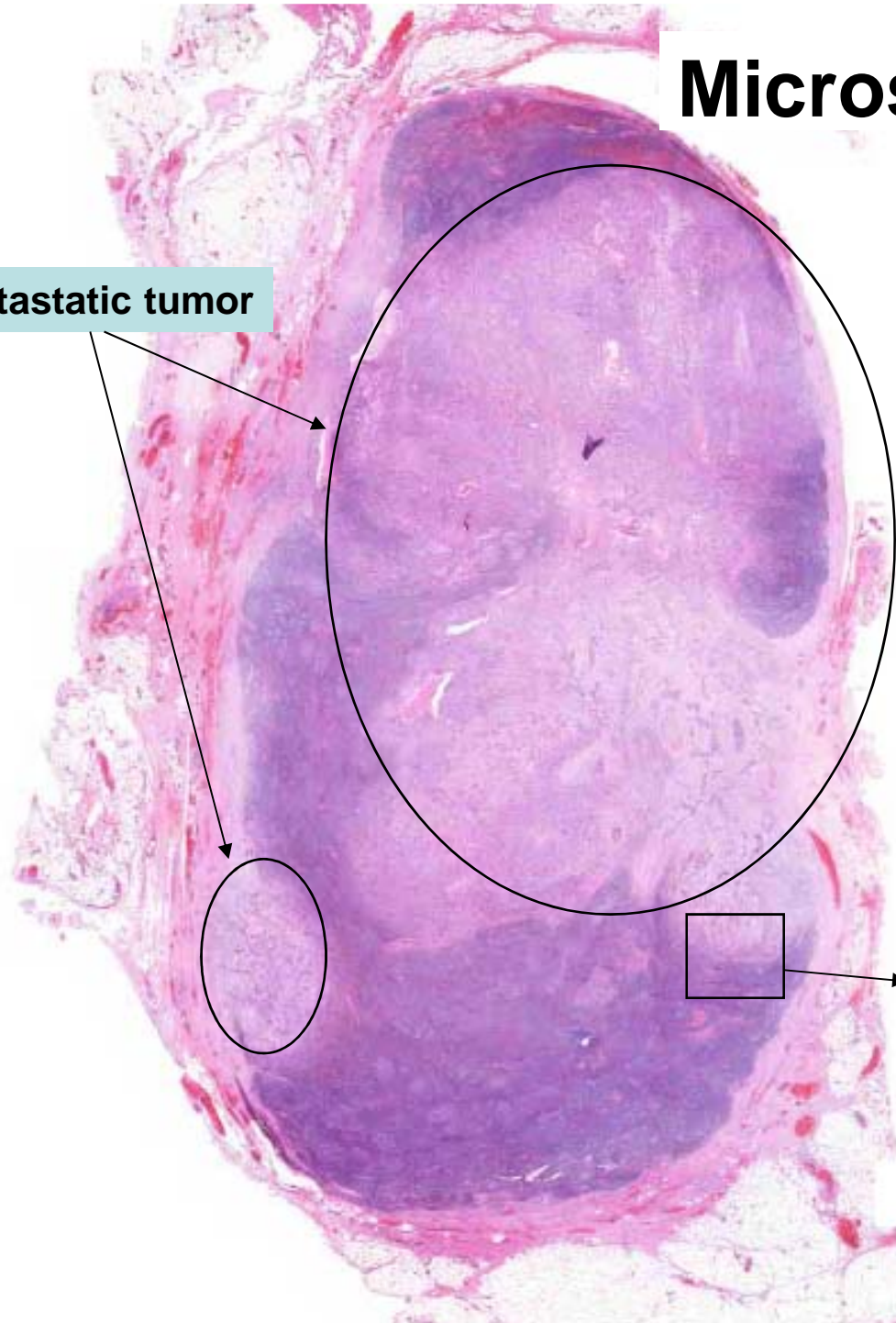
Macroscopy	
Localisation	One or more lymph node may be affected
Pattern	Focal; the lymph node may be partially or totally occupied by the metastatic tumor
Colour	Greyish
Consistency	Firm
Other	Metastatic squamous cell carcinoma may undergo cystic degeneration.
Microscopy	
1.	Tumorous areas in the lymph node parenchyma
2.	Desmoplastic stroma is present

Macroscopy



Microscopy

Metastatic tumor

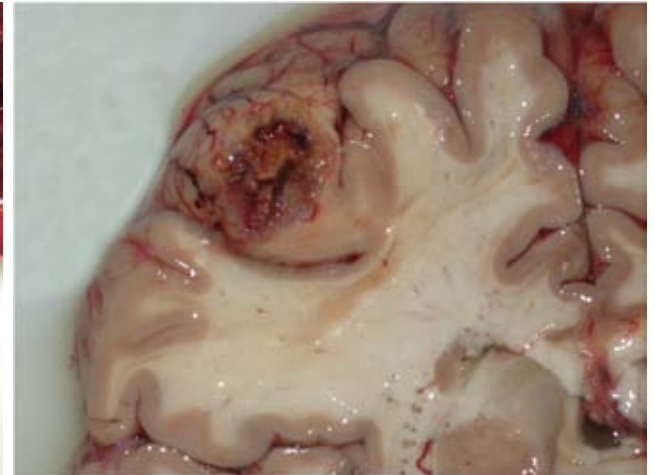


Metastases in visceral organs: Metastatic adenocarcinoma of the liver and lung, metastatic carcinoma of the brain

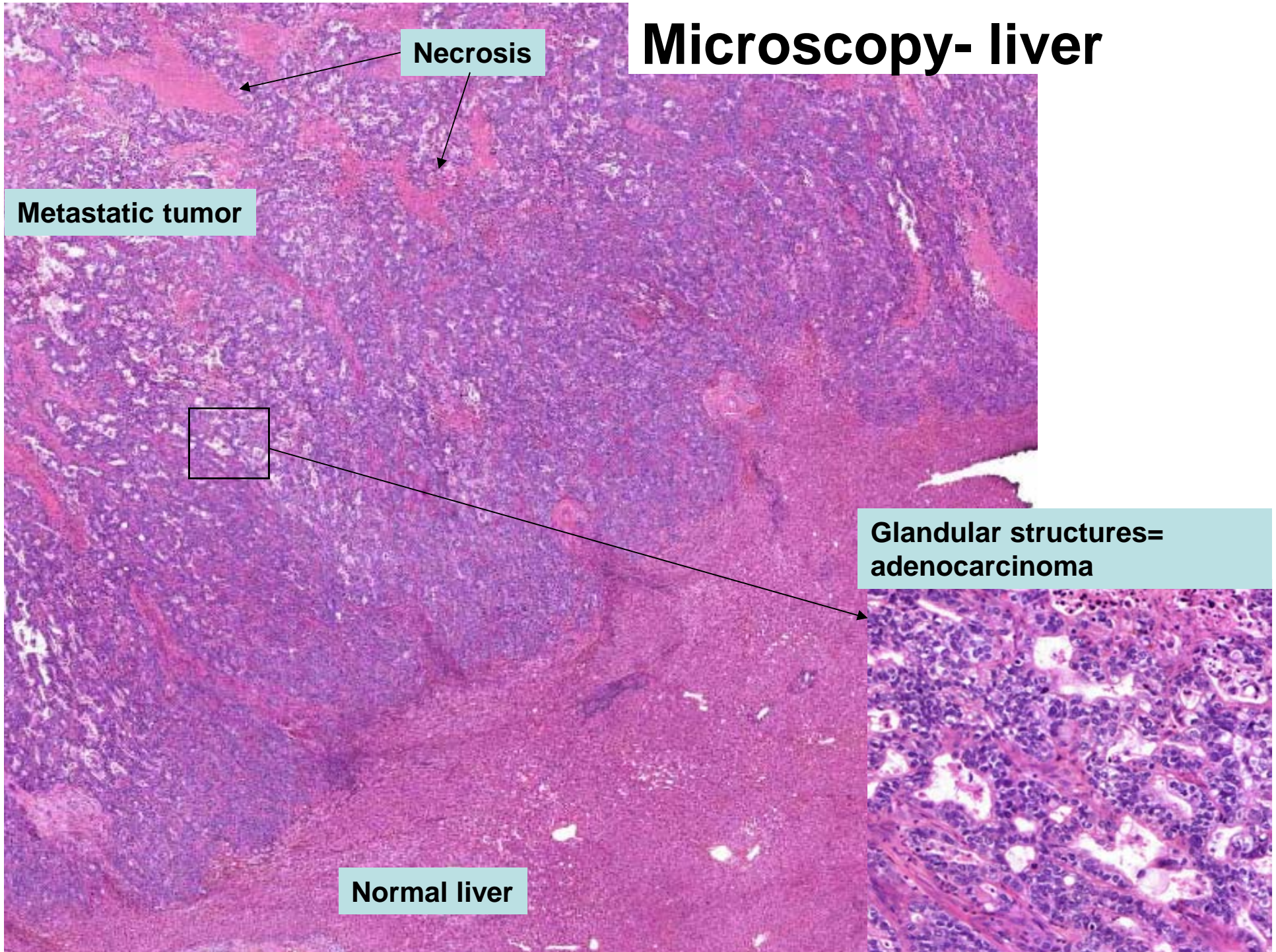
Macroscopy	
Localisation	Often occur at the periphery, but later may involve the majority of the organ
Pattern	In general, visceral metastases are well demarcated, multiple nodules. The metastatic nodules may cause retraction on the organ's surface („belly”)
Colour	Greyish
Consistency	Firm (but depends on the histological type)
Other	<p>Origin: <u>Liver</u>: <i>Portal</i> type (GI tract, pancreas); <i>Systemic</i>: breast, lung, MM</p> <p><u>Lung</u>: <i>cava</i> type (kidney, breast, genital tract, sarcomas, and. GI tract late dissemination)</p> <p><u>Brain</u>: <i>systemic</i> (lung, MM, breast, GI tract late dissemination)</p>
Microscopy	
<ol style="list-style-type: none"> 1. Circumscribed tumorous areas in the parenchyma 2. Desmoplasia present! 3. If unknown, immunohistochemistry may help to identify the primary tumor 	

Macroscopy

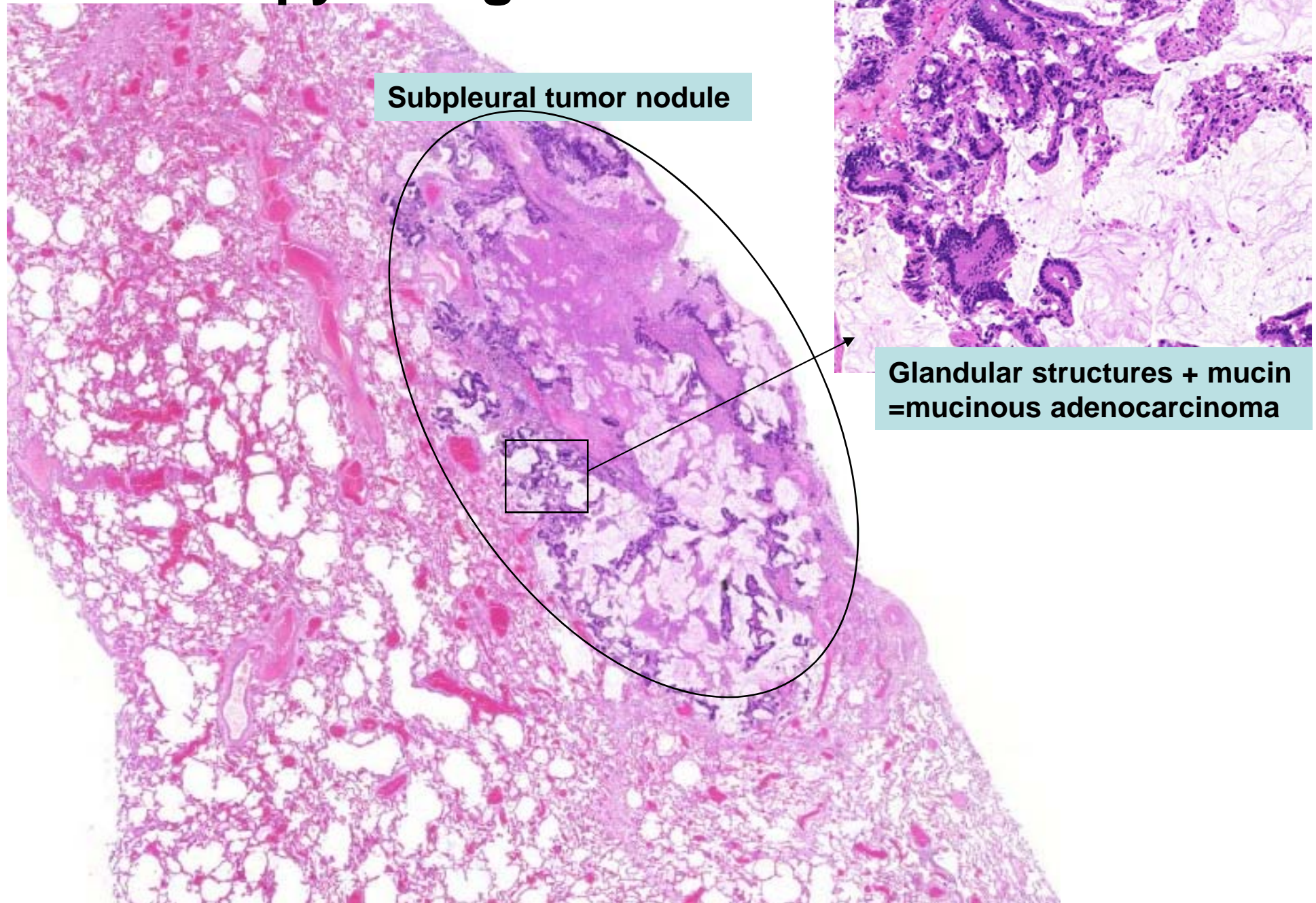
(liver– lung – brain)



Microscopy- liver

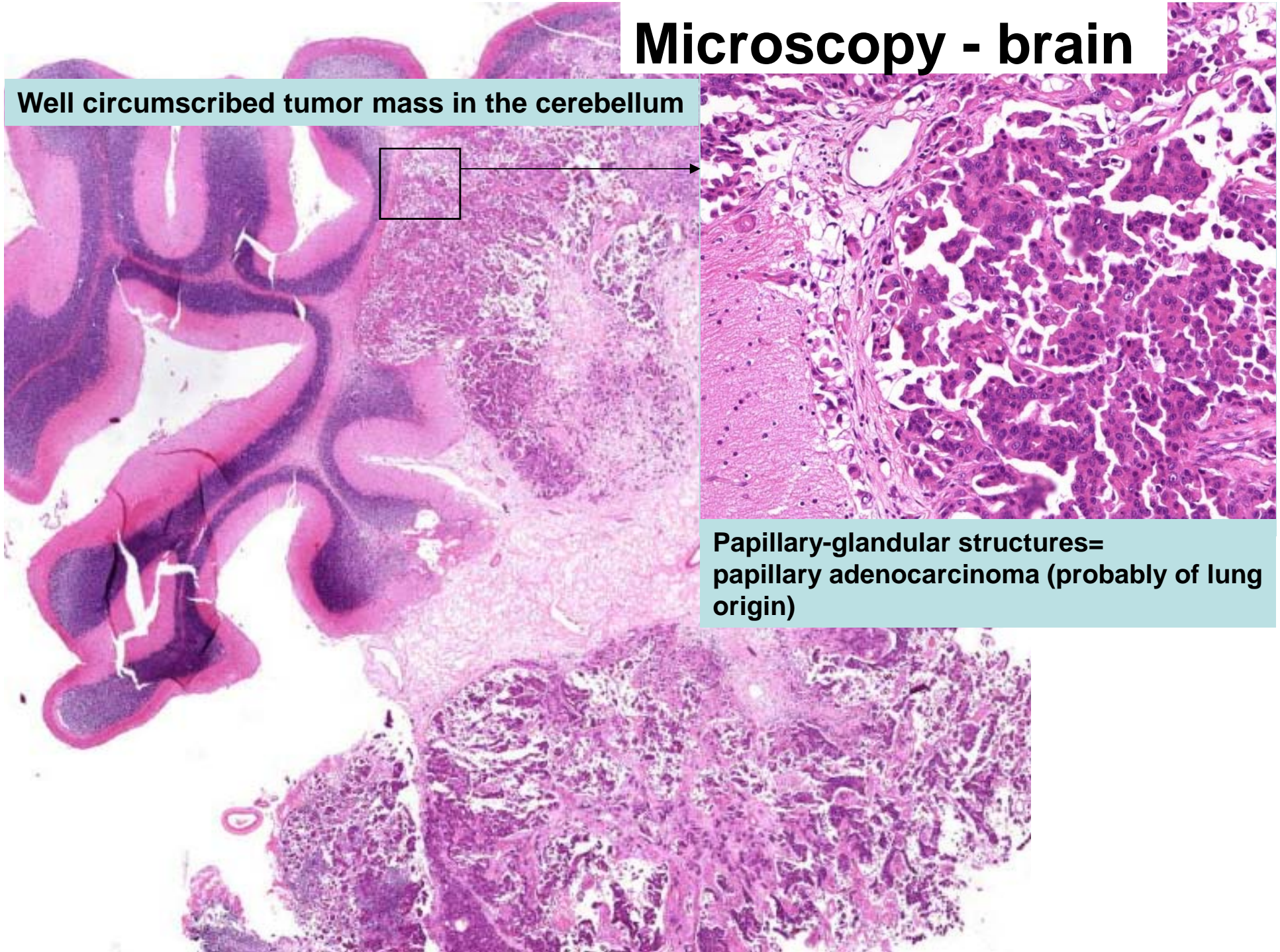


Microscopy - lung



Microscopy - brain

Well circumscribed tumor mass in the cerebellum



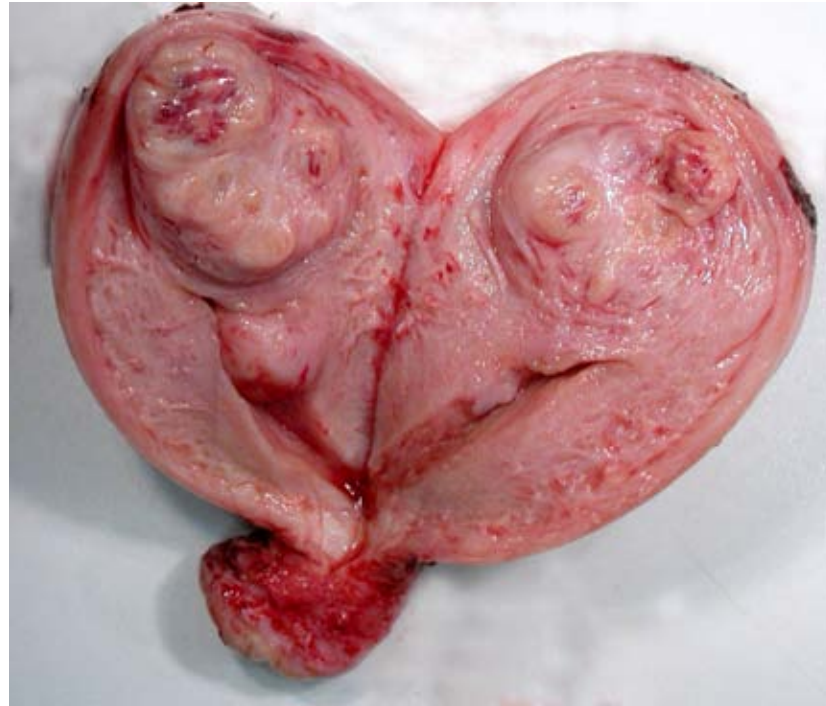
Papillary-glandular structures=
papillary adenocarcinoma (probably of lung
origin)

Leiomyoma uteri (Uterine fibroid)

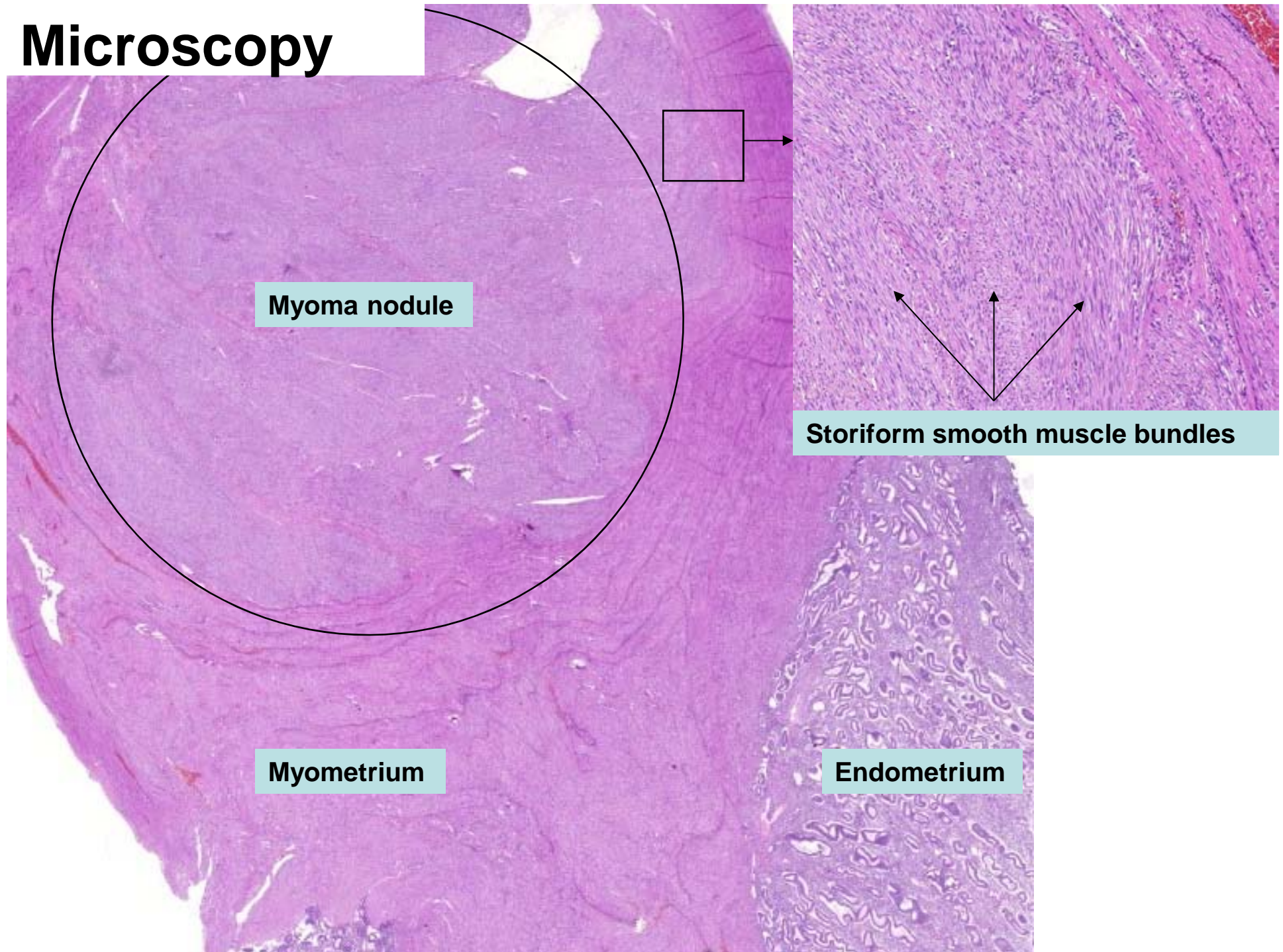
Macroscopy	
Localisation	Subserosal, intramural or submucosal
Pattern	Sharply circumscribed, storiform nodule. Often multiple.
Colour	greyish
Consistency	rubbery
Other	No malignant transformation has been described. In longstanding leiomyomas degenerative changes, fibrosis, hyalinisation or calcification may occur
Microscopy	
1.	Expansile growth: Compresses surrounding tissues
2.	Fully differentiated smooth muscle cells. No or very few mitosis, no necrosis, no atypia (but rarely bizarr cells may be present)

Macroscopy

(example: intramural leiomyoma)



Microscopy



Myoma nodule

Myometrium

Storiform smooth muscle bundles

Endometrium

Leiomyosarcoma uteri

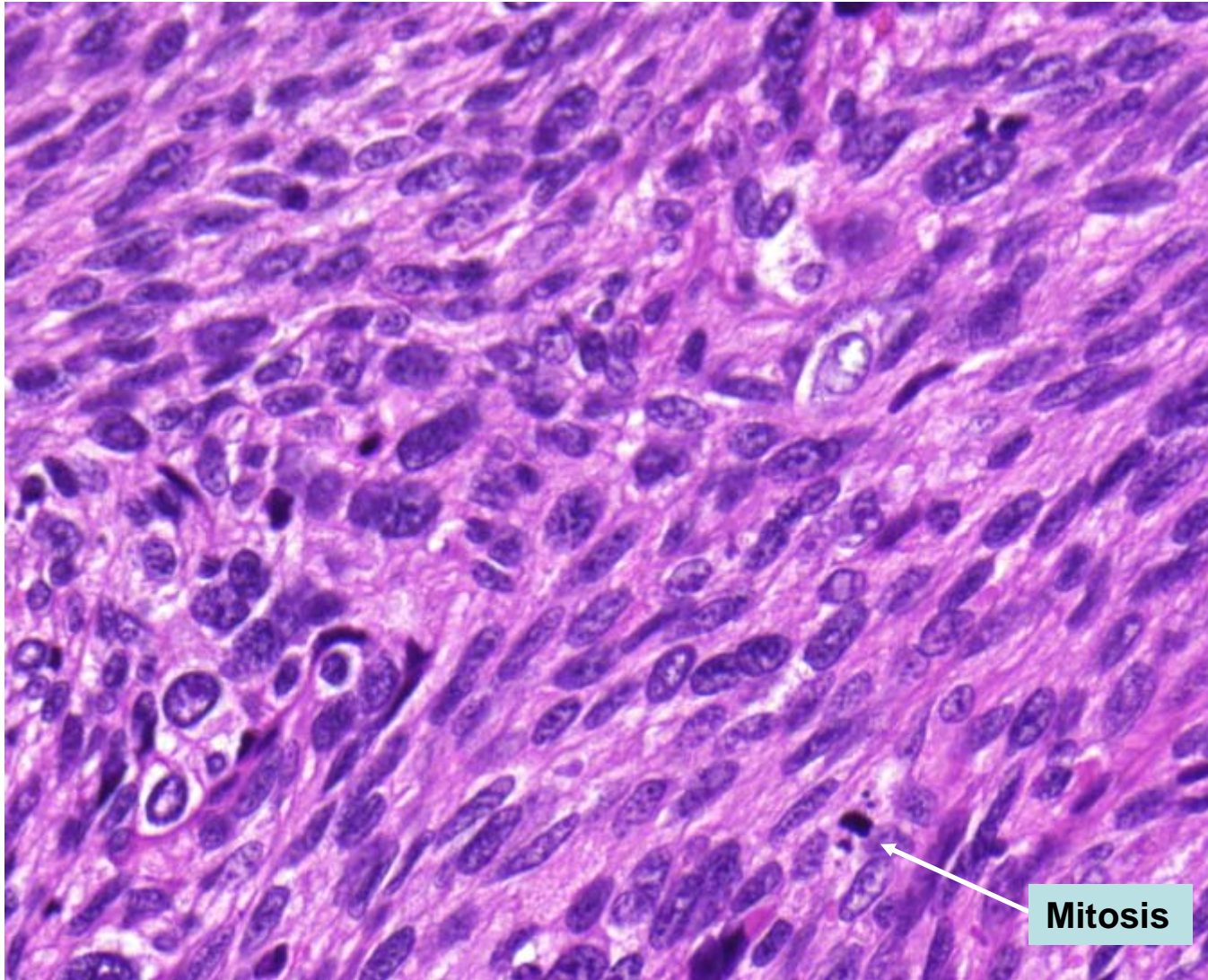
Macroscopy	
Localisation	Mostly intramural
Pattern	Solitary, may occur aside leiomyomas, large
Colour	Variiegated, hemorrhage, necrosis
Consistency	Variable
Other	Metastases via blood stream → lung
Microscopy	
1.	Expansile/infiltrative growth: compresses/invades surrounding tissues
2.	Spindle cell malignant tumor (atypia+mitoses+necrosis!) → immunohistochemistry! (smooth muscle actin)

Macroscopy

(Uterus here cannot be identified)



Microscopy

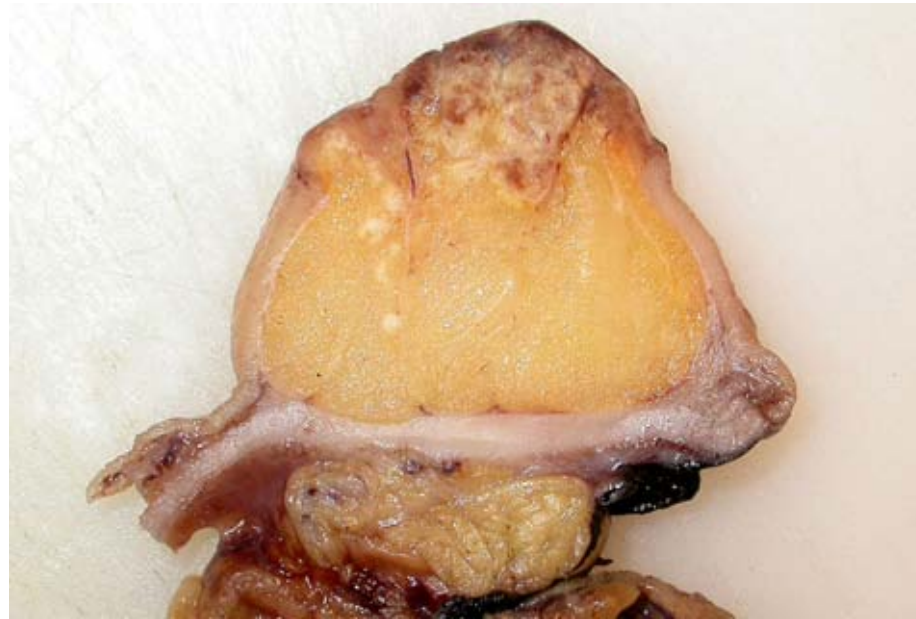


Lipoma

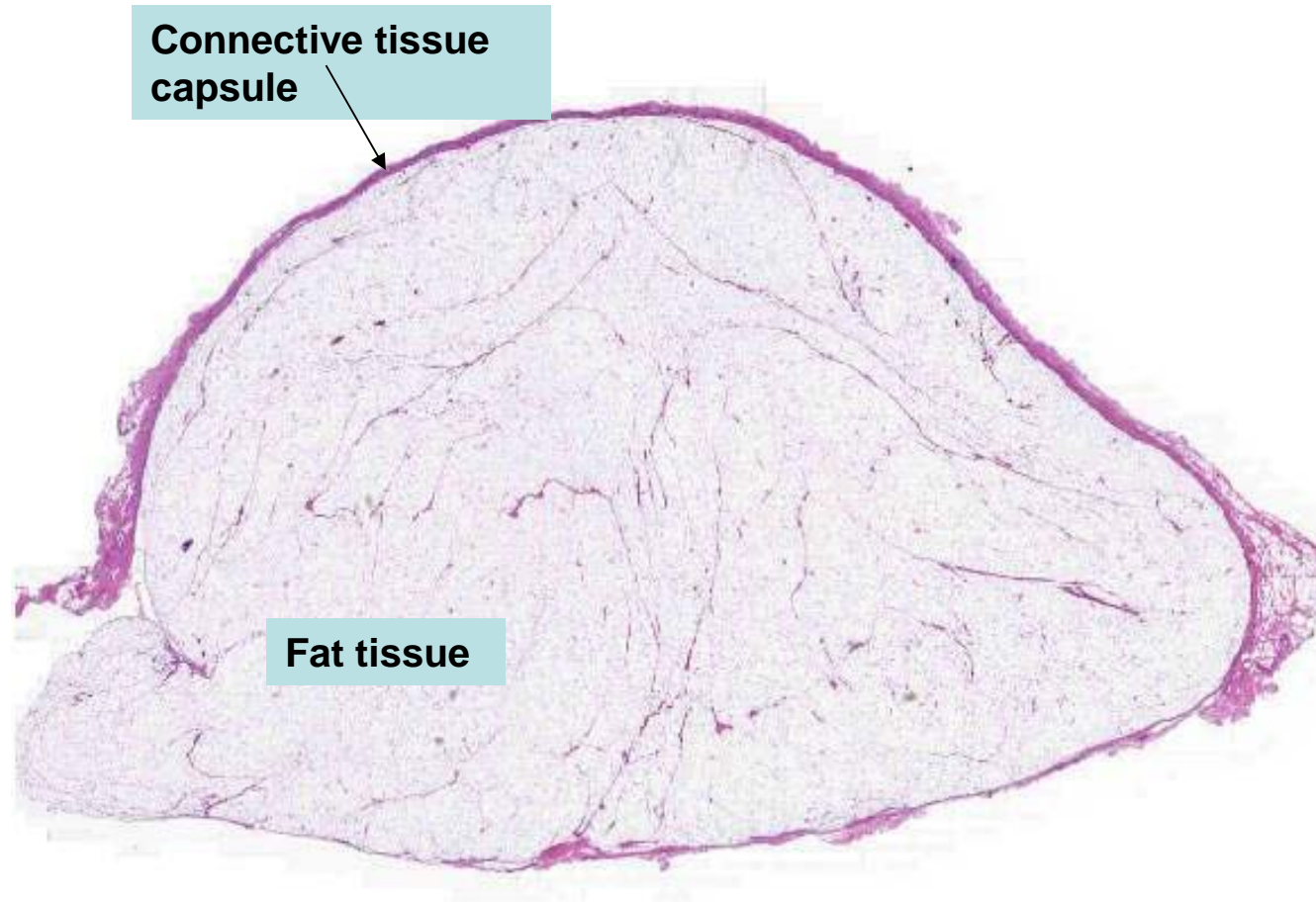
Macroscopy	
Localisation	Most common in subcutaneous fat tissue, occasionally submucosa
Pattern	Sharply circumscribed, homogenous fatty nodule with thin capsule. May be multiple (=lipomatosis).
Colour	Yellow
Consistency	Soft
Other	No malignant transformation
Microscopy	
1.	Expansile growth: compresses surrounding tissues
2.	Well differentiated fat cells. No mitosis, no atypia, no necrosis
3.	Special forms:
•	Capillary proliferation in a lipoma: angioliipoma
•	Vessels+smooth muscle+fat tissue components: angiomyoliipoma (mainly in the kidney)
•	Bone marrow + fat tissue: myeloliipoma (adrenal gland)

Macroscopy

(example: submucosal lipoma)



Microscopy



Liposarcoma

Macroscopy

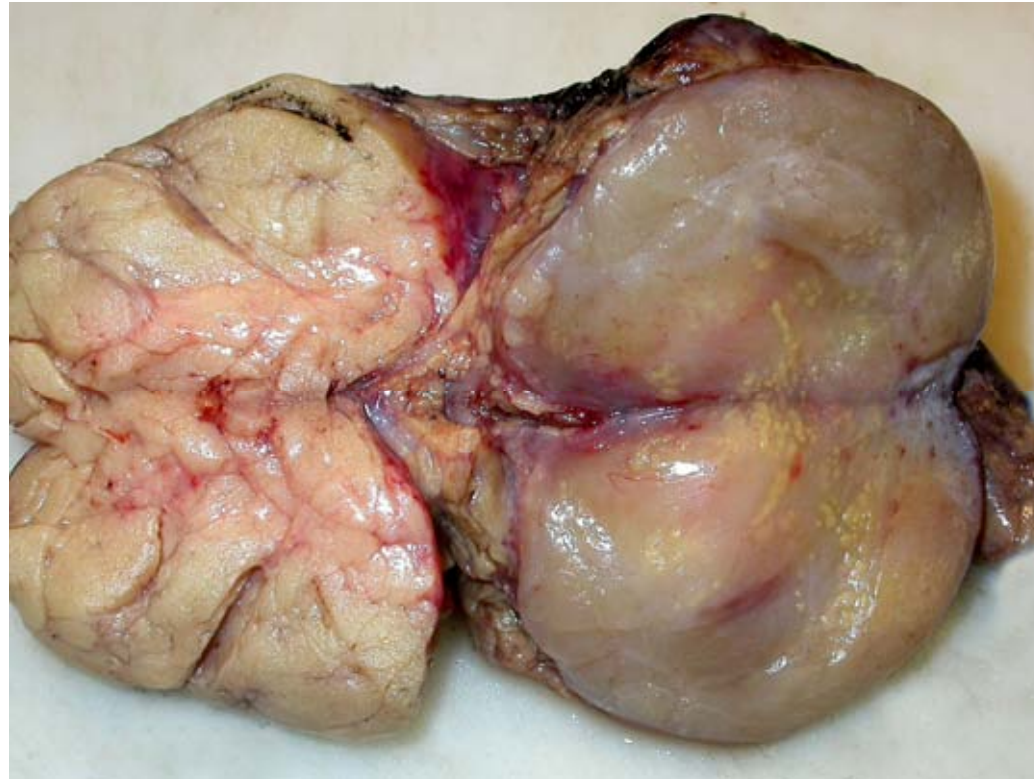
Localisation	Most commonly retroperitoneum and deep soft tissues
Pattern	Very large fatty tumor or tumors, necrosis common
Colour	Yellow, yellowish-grey
Consistency	Rubbery, soft (myxoid liposarcoma=mucoid substance)
Other	Rarely metastasize – locally aggressive, recurrences,

Microscopy

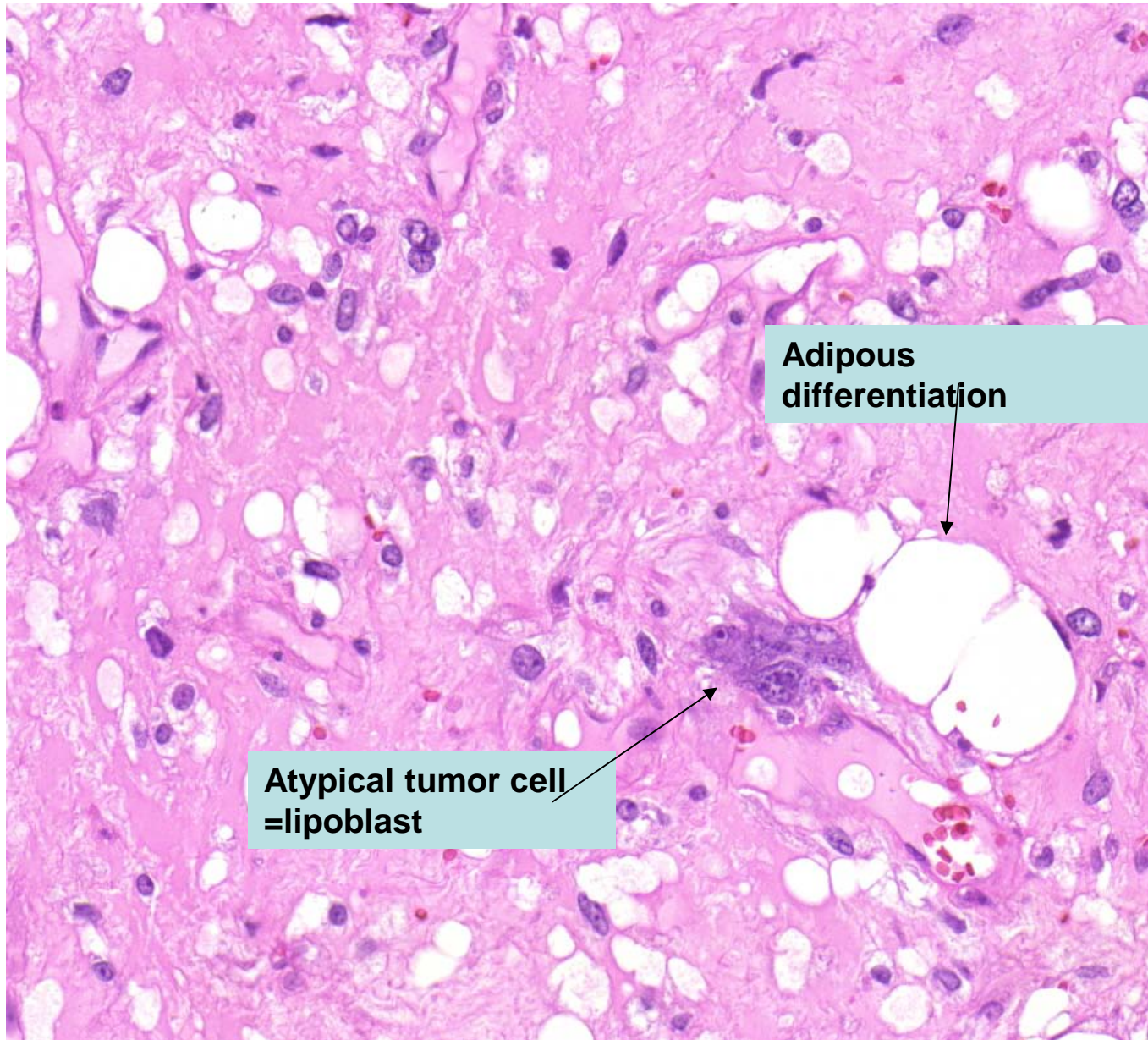
1. Expansile growth: compresses surrounding tissues
2. Poorly differentiated cells=lipoblasts. May look like a totally undifferentiated spindle cell tumor– immunohistochemistry (adipocyte marker= S-100), or FISH (specific gene rearrangements), or cytogenetics (chromosomal alterations)

Macroscopy

(left: well differentiated, right: poorly differentiated liposarcoma component)



Microscopy



**Adipous
differentiation**

**Atypical tumor cell
=lipoblast**

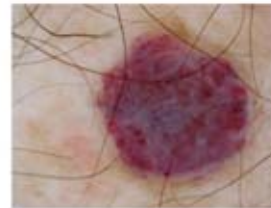
Capillary hemangioma of the skin

Macroscopy	
Localisation	Anywhere on the skin. Congenital forms may be very large
Pattern	Small, well circumscribed nodule.
Colour	Red.
Consistency	Rubbery
Other	No malignant transformation exists
Microscopy	
1.	Well circumscribed tumor in the dermis
2.	Groups of capillaries formed by mature endothelial cells

Macrosocopy

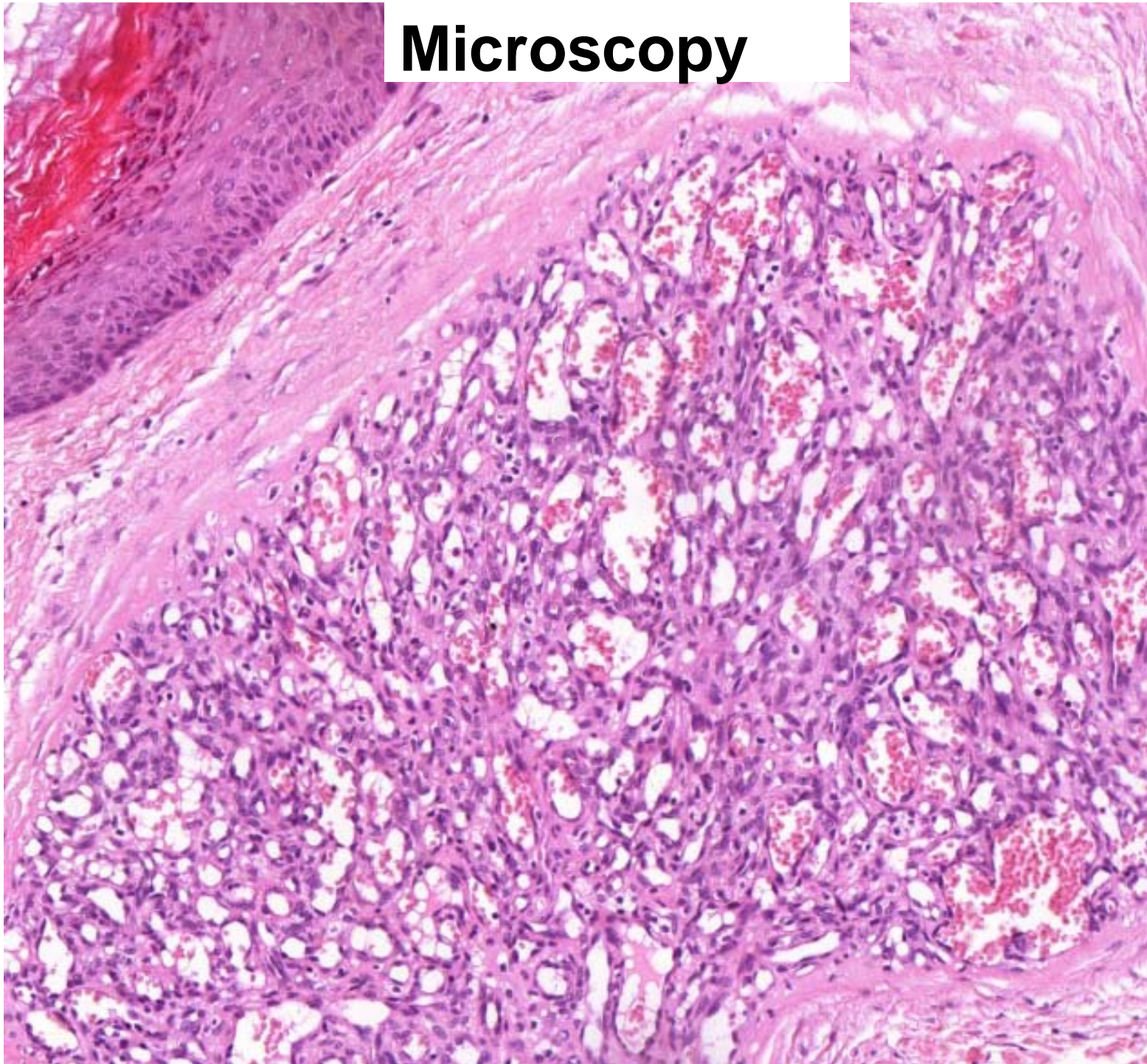


Haemangiomas can be quite dark red at times and may thrombose. They very rarely bleed.



source: <http://dermoscopymadesimple.blogspot.hu/2010/09/haemangioma.html>

Microscopy



Angiosarcoma

Macroscopy

Localisation	Anywhere (<i>special</i> : skin-Kaposi sarcoma, breast: post irradiation angiosarcoma)
Pattern	Infiltrative, blurred edge
Colour	Redish, brownish (abundant hemosiderin)
Consistency	variable
Other	Hematogenous metastases → lung

Microscopy

1. Infiltrative growth
2. Poorly differentiated spindle cell tumor (but other variants exist) with abortive vascular structures, extravasated RBCs, necrosis
3. Immunohistochemistry (endothelial markers e.g.: CD31)

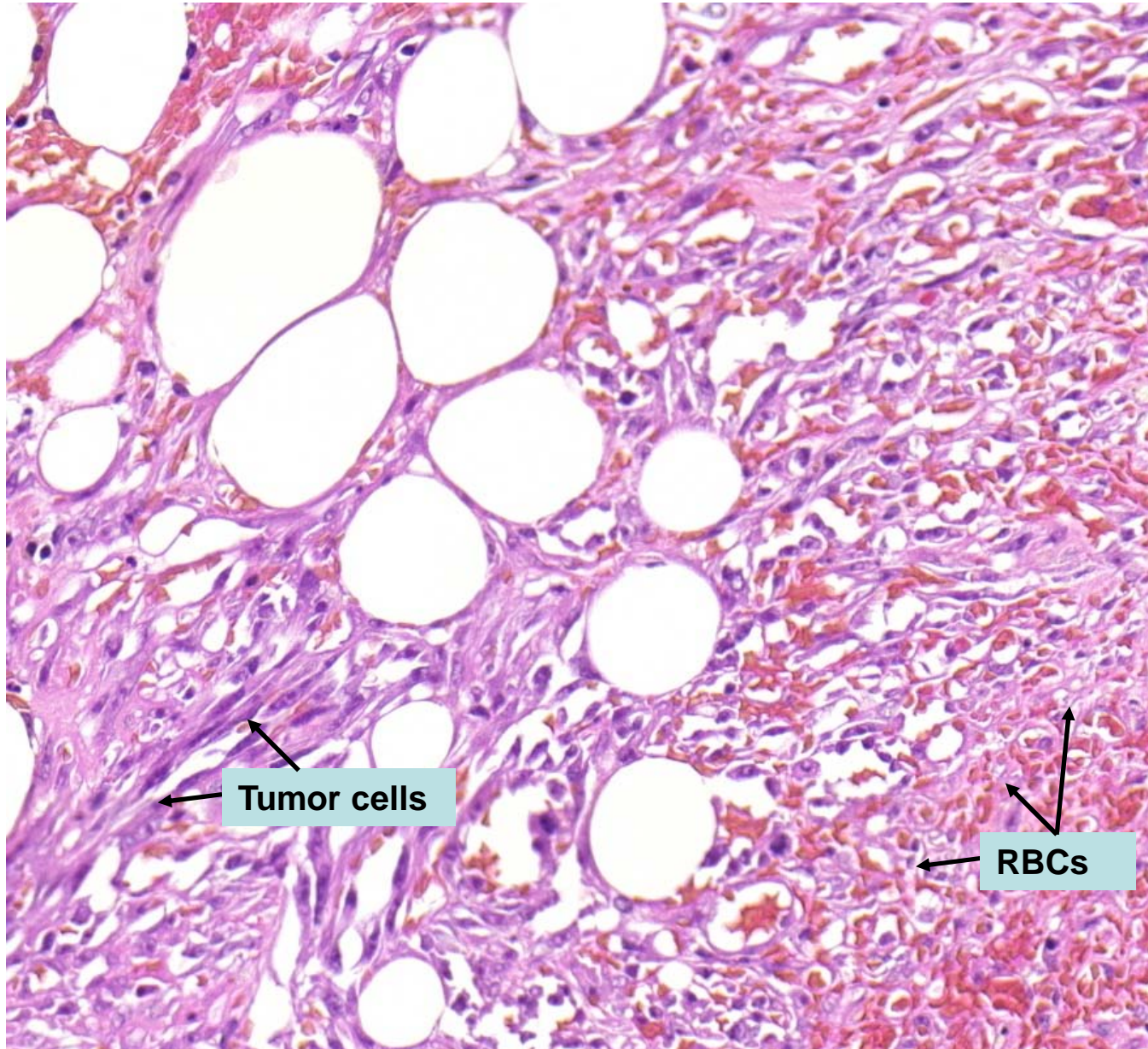
Macroscopy



Breast, postirradiation angiosarcoma

Microscopy

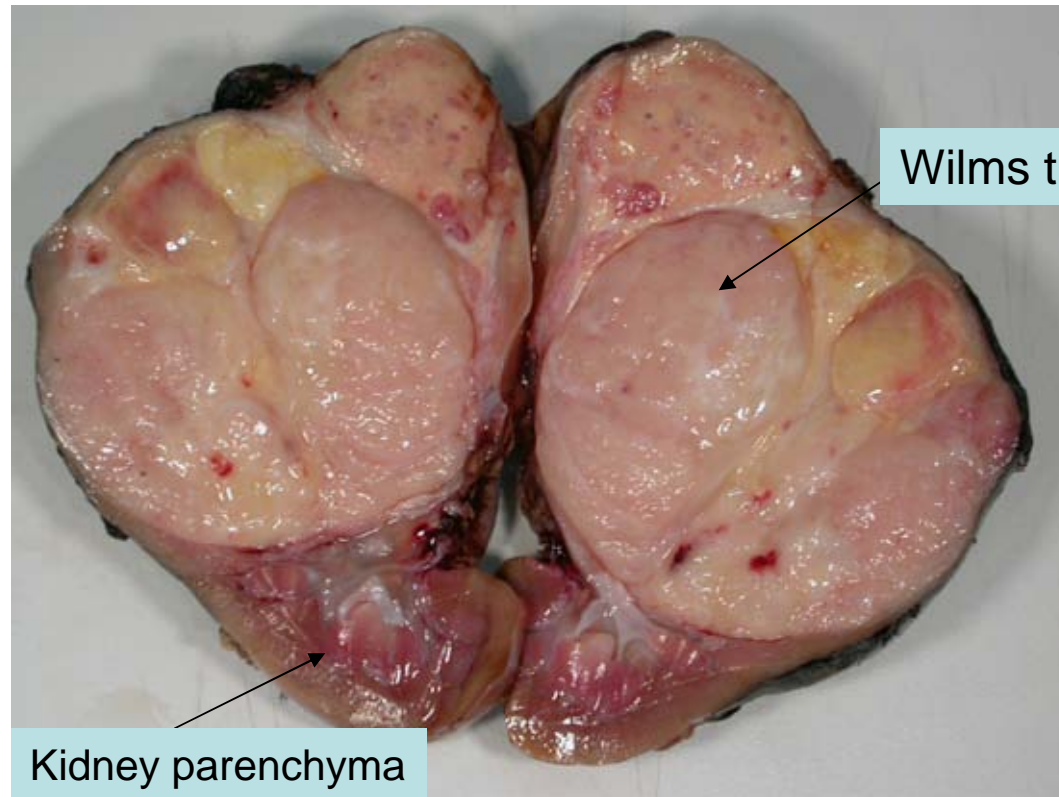
Fat tissue infiltrated by the tumor



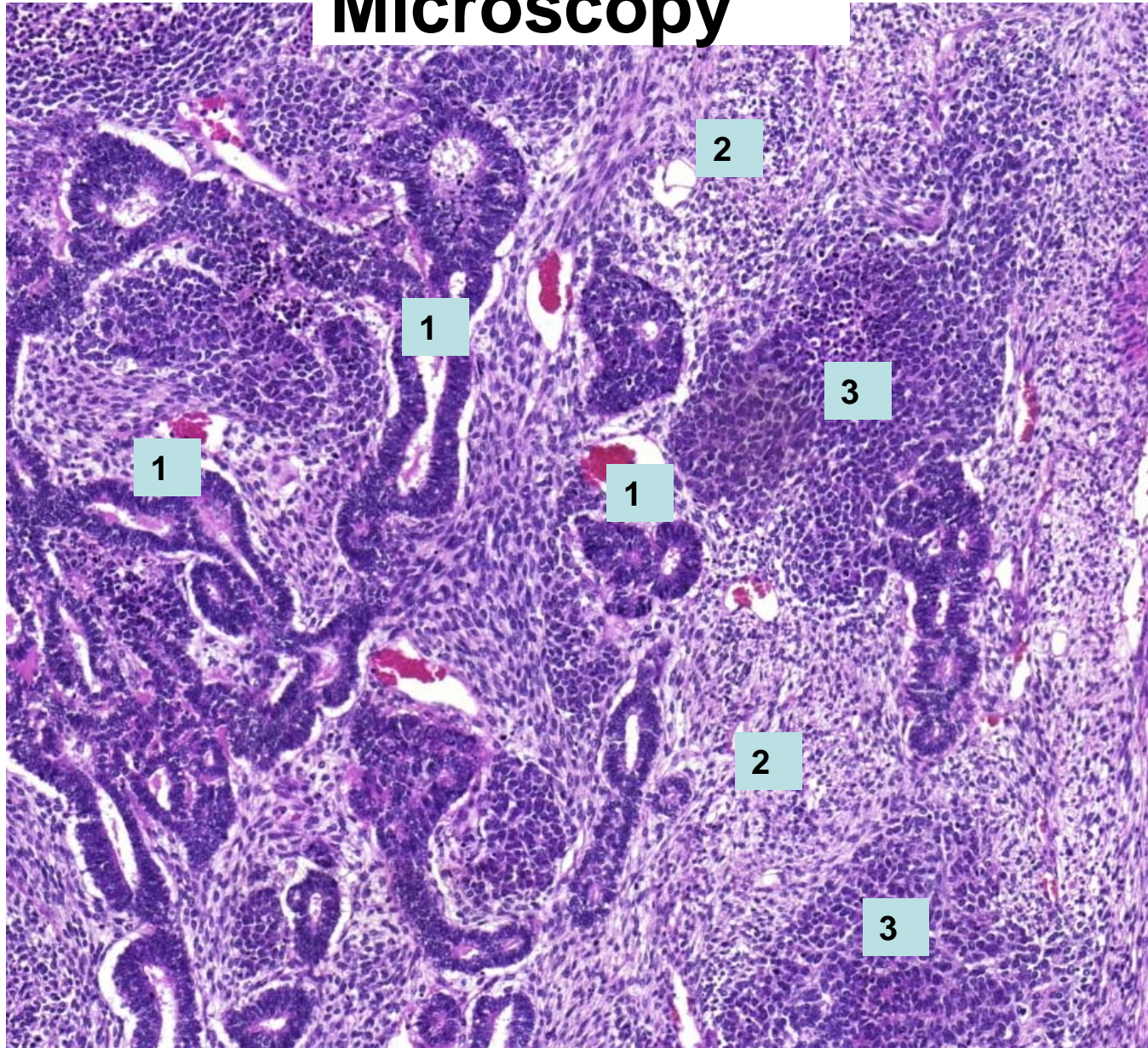
Nephroblastoma (Wilms tumor)

Macroscopy	
Localisation	Retroperitoneal, rapidly growing tumor in young children (kidney)
Pattern	Large, expansile tumor
Colour	Variable
Consistency	Variable
Other	Surgery is performed following chemotherapy → extensive necrosis
Microscopy	
3 components:	
1.	Epithelial (immature tubules)
2.	Mesenchymal (embryonal spindle cell stroma)
3.	Blastema („small blue cells”)

Macroscopy



Microscopy



Neuroblastoma

Macroscopy

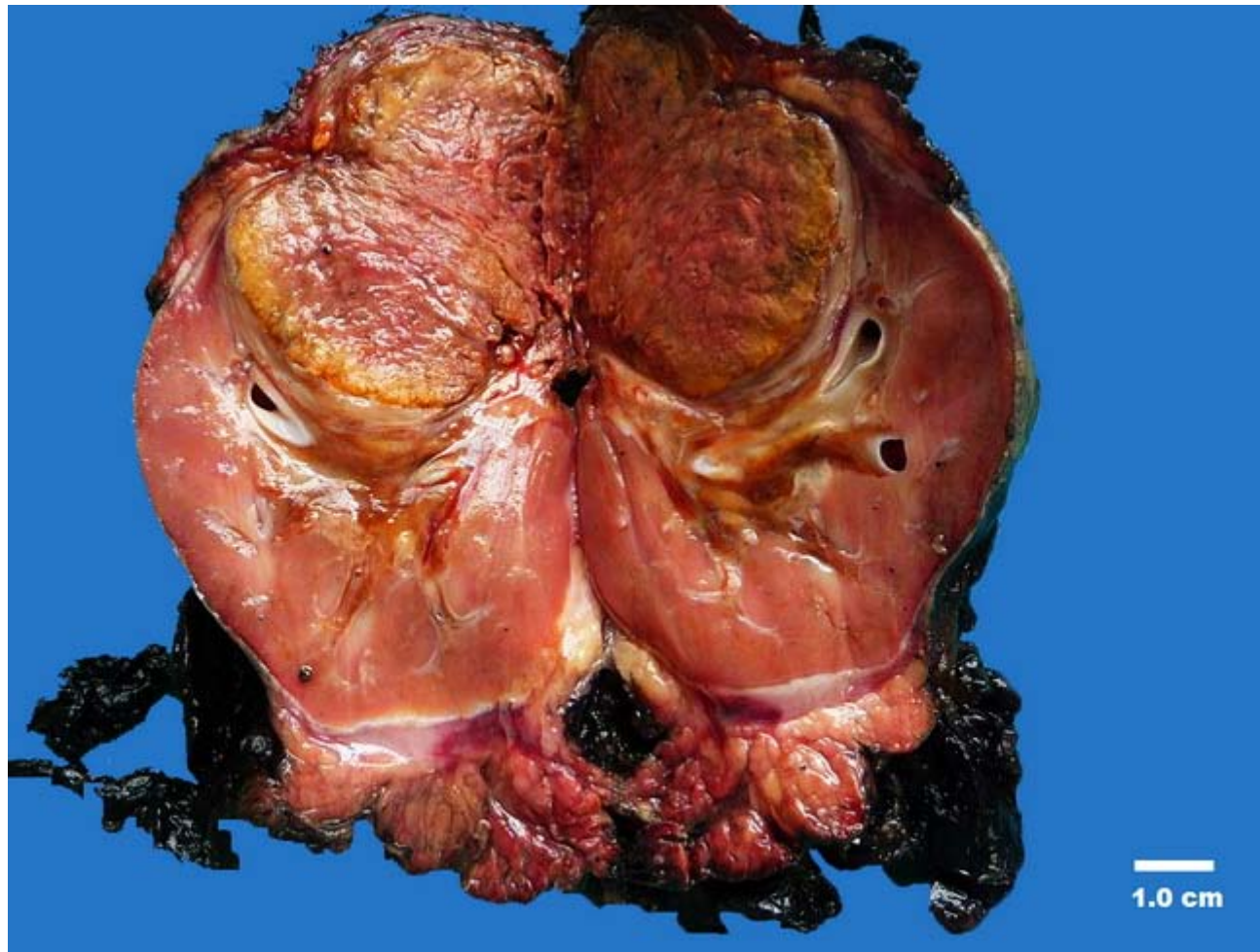
Localisation	Retroperitoneal – adrenal gland, less frequently mediastinum (young children)
Pattern	Size is variable, expansile tumor
Colour	Variable
Consistency	Variable
Other	Surgery is performed following chemotherapy → extensive necrosis

Microscopy

1. Neuroblastoma (immature neural tissue): „small blue cell” tumor, neurotubule formation (Homer-Wright rosettes)
2. Ganglioneuroblastoma (mixed immature+mature tissue): blasts + mature component (ganglion cells+Schwann cells)
3. Ganglioneurinoma (mature tissue): fully mature tumor, ganglion cells + Schwann cells

Macroscopy

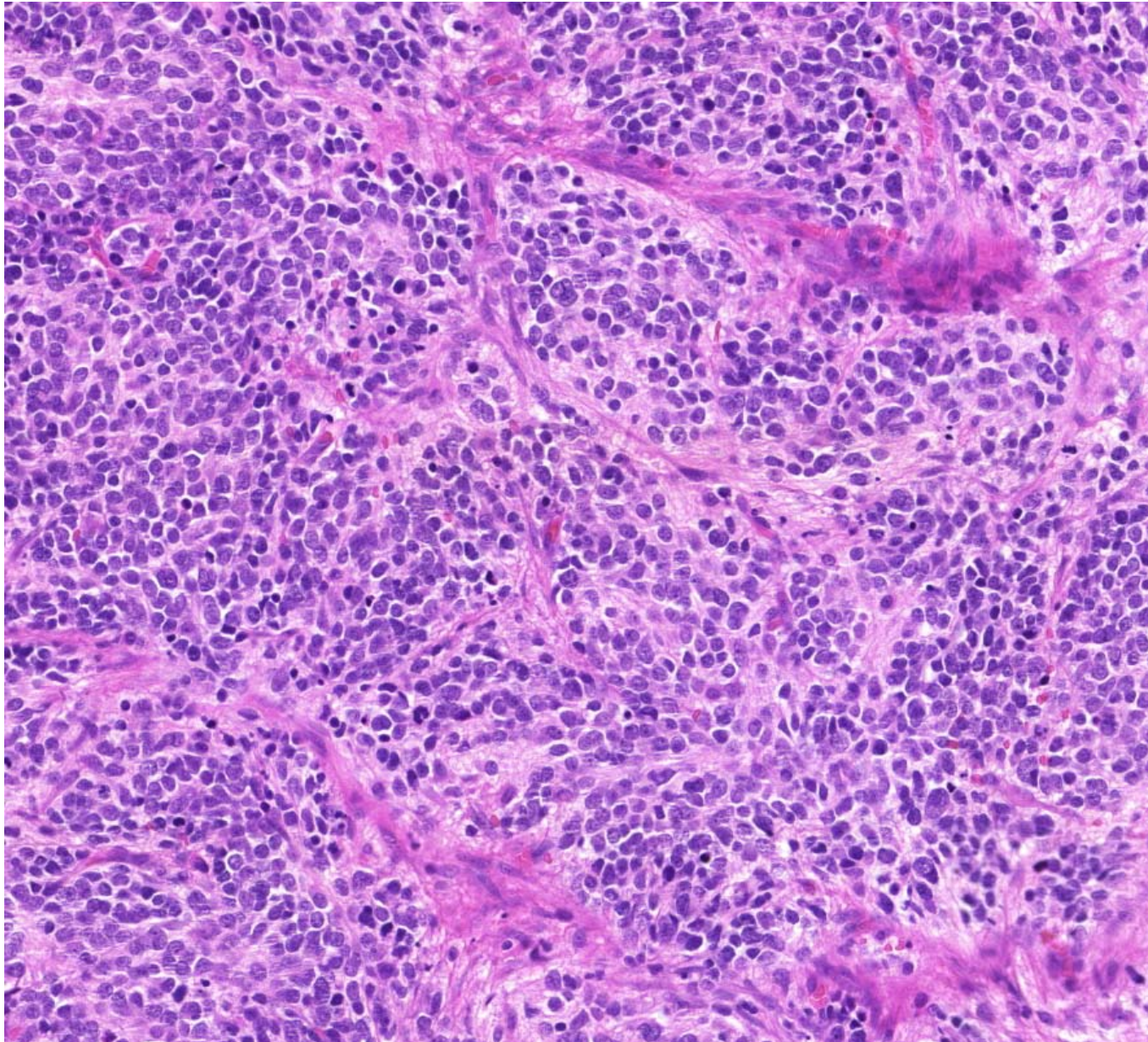
Neuroblastoma of the adrenal gland, distorting the kidney



Source: <http://www.webpathology.com/image.asp?n=1&Case=84>

Microscopy

Neuroblastoma- immature tumor



Osteosarcoma

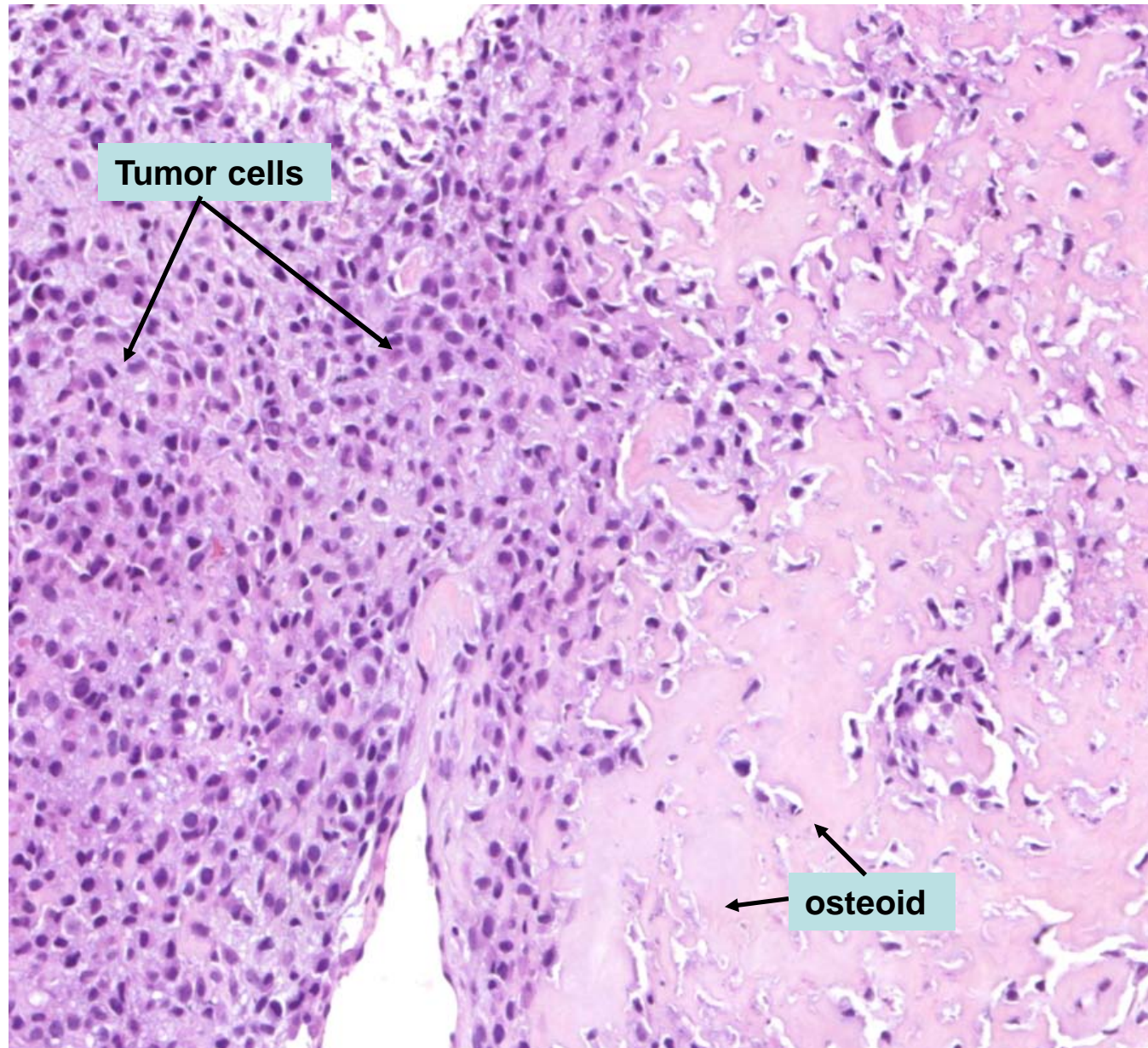
Macroscopy	
Localisation	Most common in long bones' (tibia-femur-humerus) metaphyseal edge.
Pattern	Usually circumscribed, elevates the periosteum, later invades it.
Colour	variable, necrotic - hemorrhagic.
Consistency	hard.
Other	Hematogenous metastases → lung
Microscopy	
Osteoid (extracellular matrix) production!!!	
Polymorph tumor cells	

Macroscopy



Source: <http://www.physio-pedia.com/Osteosarcoma>

Microscopy



Rhabdomyosarcoma

Macroscopy

Localisation	Most common in the head and neck region. Special form: botryoid rhabdomyosarcoma, occurring in the vagina, gall bladder, urinary bladder of young children.
Pattern	Usually well circumscribed or infiltrative tumor in the deep soft tissues. The botryoid variant is grape-like.
Colour	Yellowish – brownish - redish, necrotic.
Consistency	Rubbery - soft (fishmeat-like)
Other	Hematogenous metastases → lung

Microscopy

1. Usually infiltrative growth
2. Solid structure
3. Morphology: extremely polymorphic cells, scattered cells with eosinophilic cytoplasm, occasionally with striation, excentrically located nucleus.
Immunohistochemistry! (e.g.: sarcomeric-actin)
4. Special types: embrional (=„small blue cell” tumor); alveolar

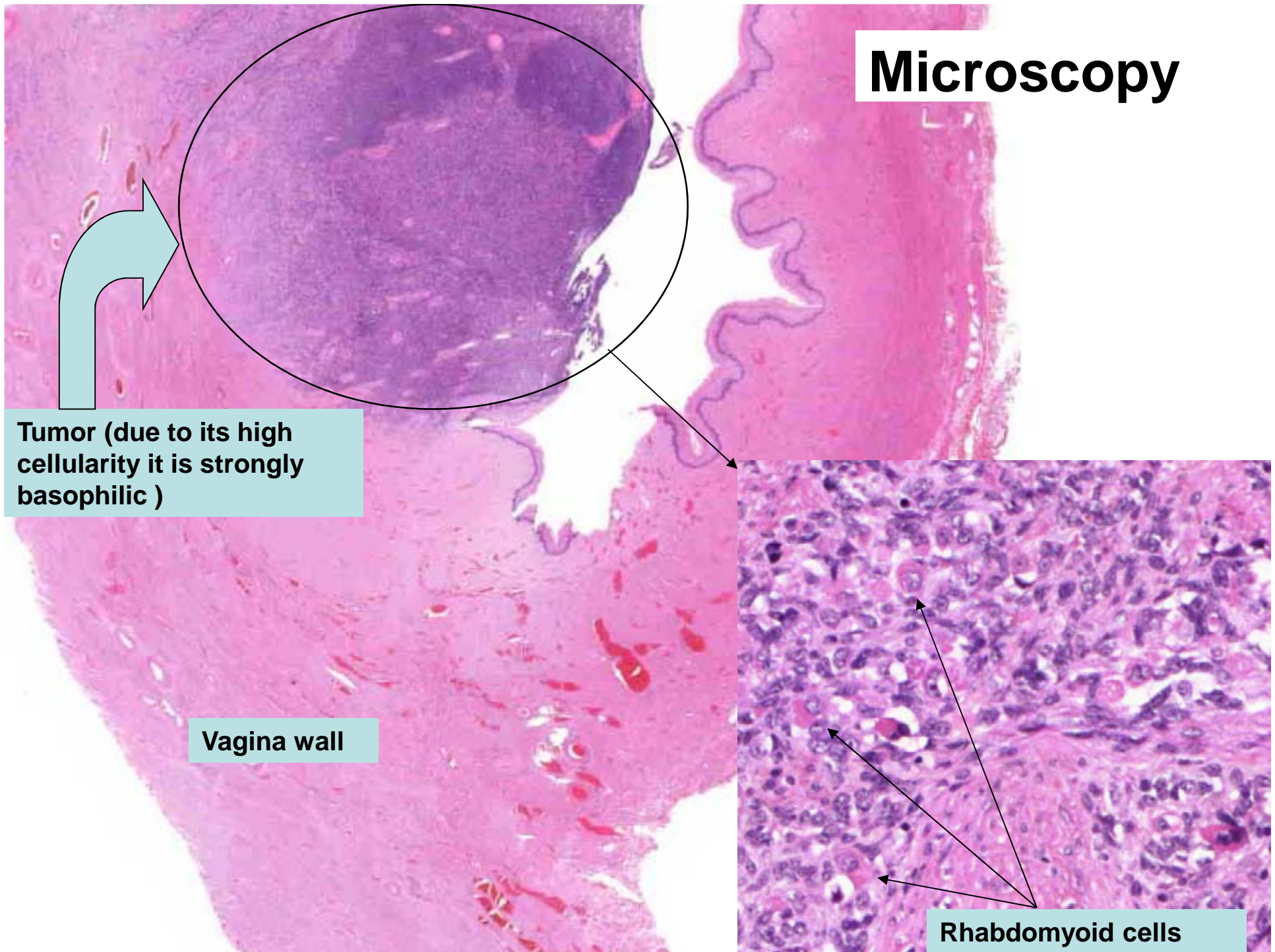
Macroscopy

Example: botryoid rhabdomyosarcoma



Source: <http://www.webpathology.com/image.asp?case=471&n=2>

Microscopy



Tumor (due to its high cellularity it is strongly basophilic)

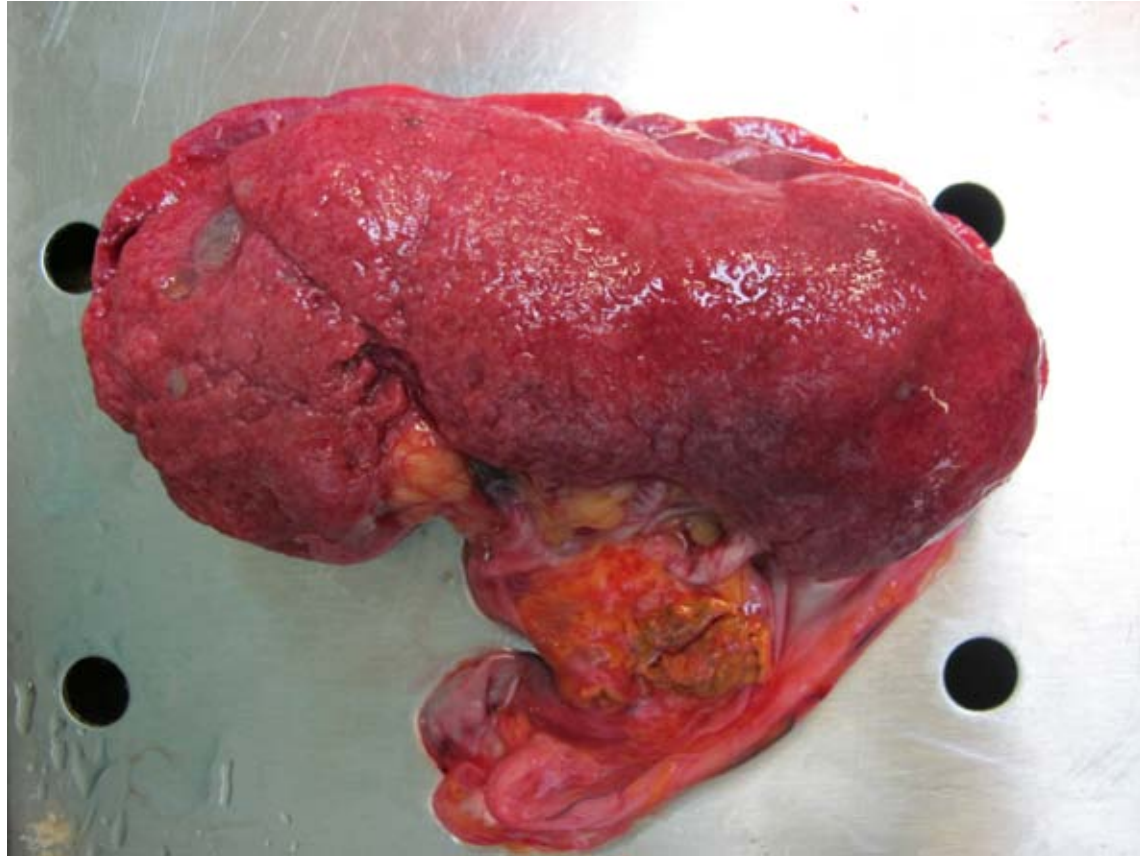
Vagina wall

Rhabdomyoid cells

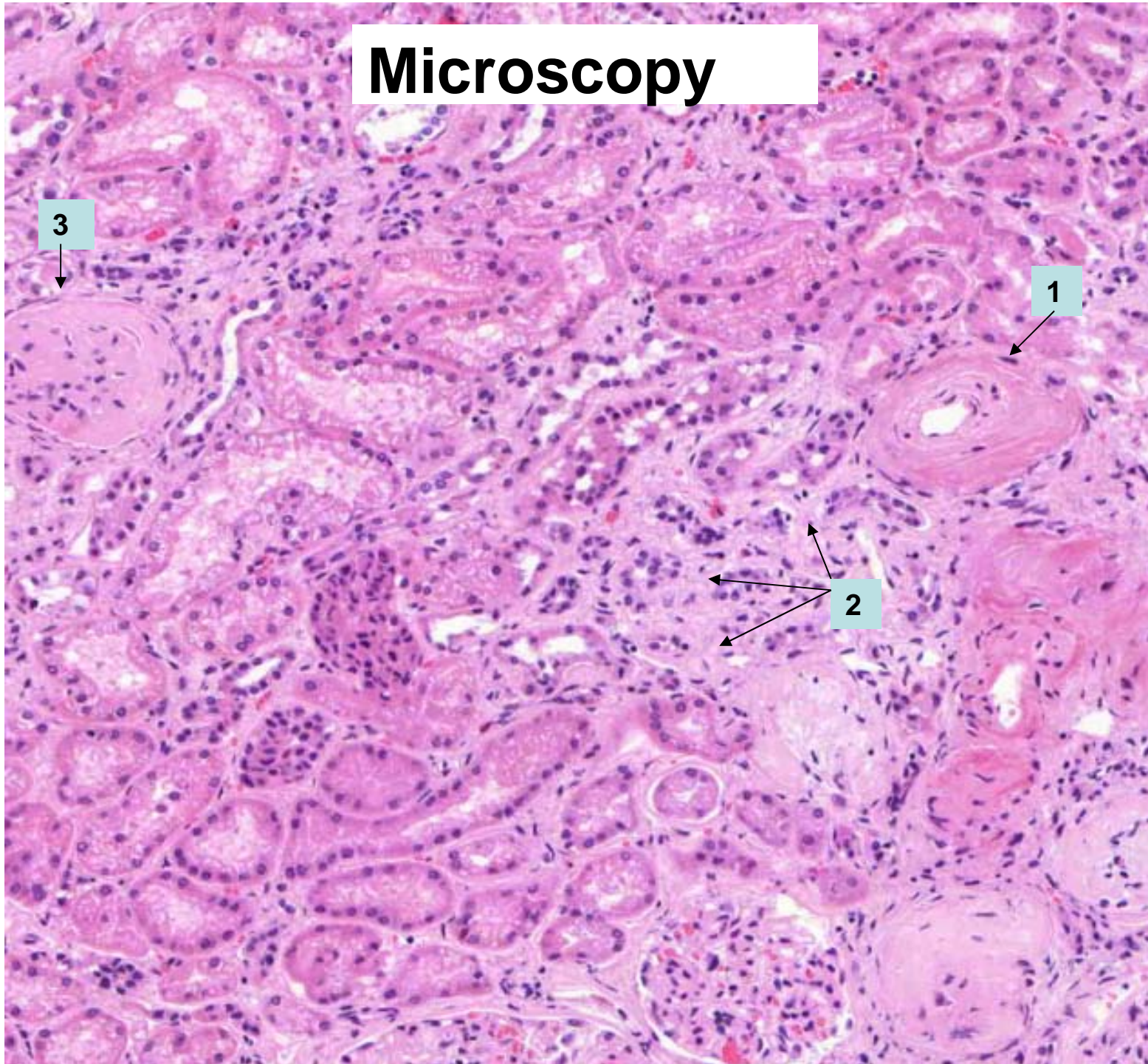
Arteriolosclerosis (kidney)

Macroscopy	
Localisation	Both kidneys are affected
Pattern	Diffuse. Granular surface is typical, parenchyma is atrophic.
Colour	
Consistency	
Other	
Microscopy	
<ol style="list-style-type: none">1. The media layer of the arterioles is thickened, hyalinised2. Interstitial fibrosis3. Advanced cases: glomerulosclerosis	

Macroscopy



Microscopy



Atherosclerosis

Macroscopy

Localisation	Large – medium size arteries.
Pattern	Circumscribed or confluent plaque. More severe at bifurcations
Colour	Yellow - grey
Consistency	Fibrotic plaque: firm Calcified plaque: bony hard Atheromatous plaque: soft
Other	Complicated plaque: hemorrhage, thrombosis, rupture-atheroma-embolisation, aneurysma formation, dissection

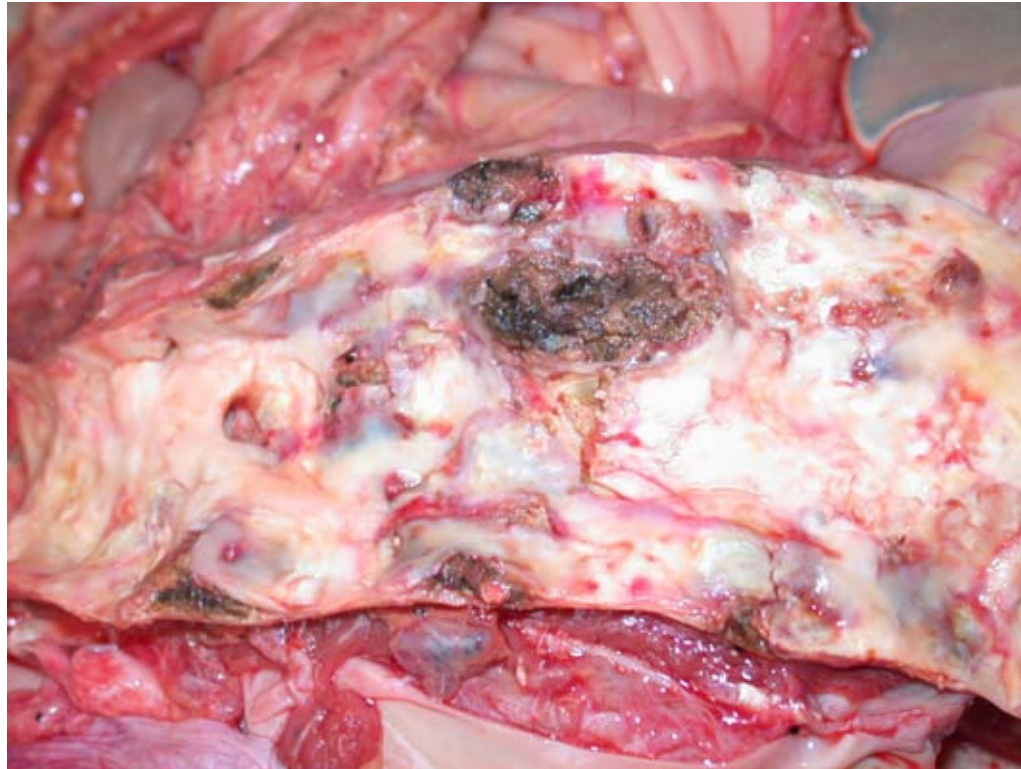
Microscopy

The plaque is formed in the intima.

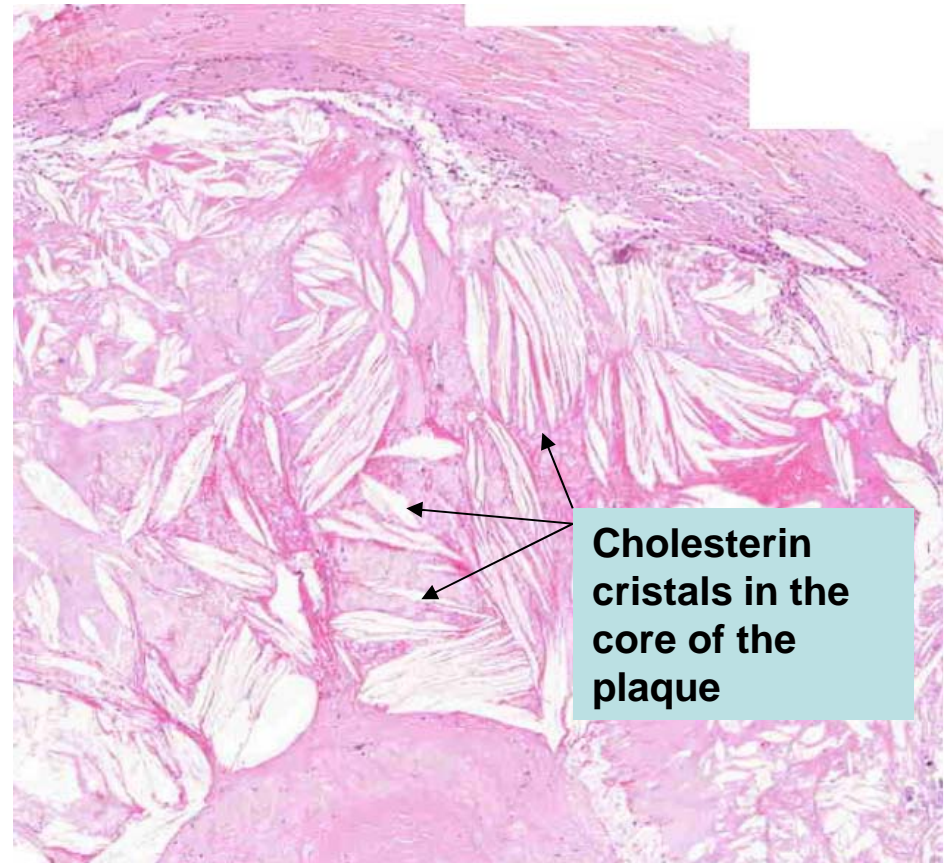
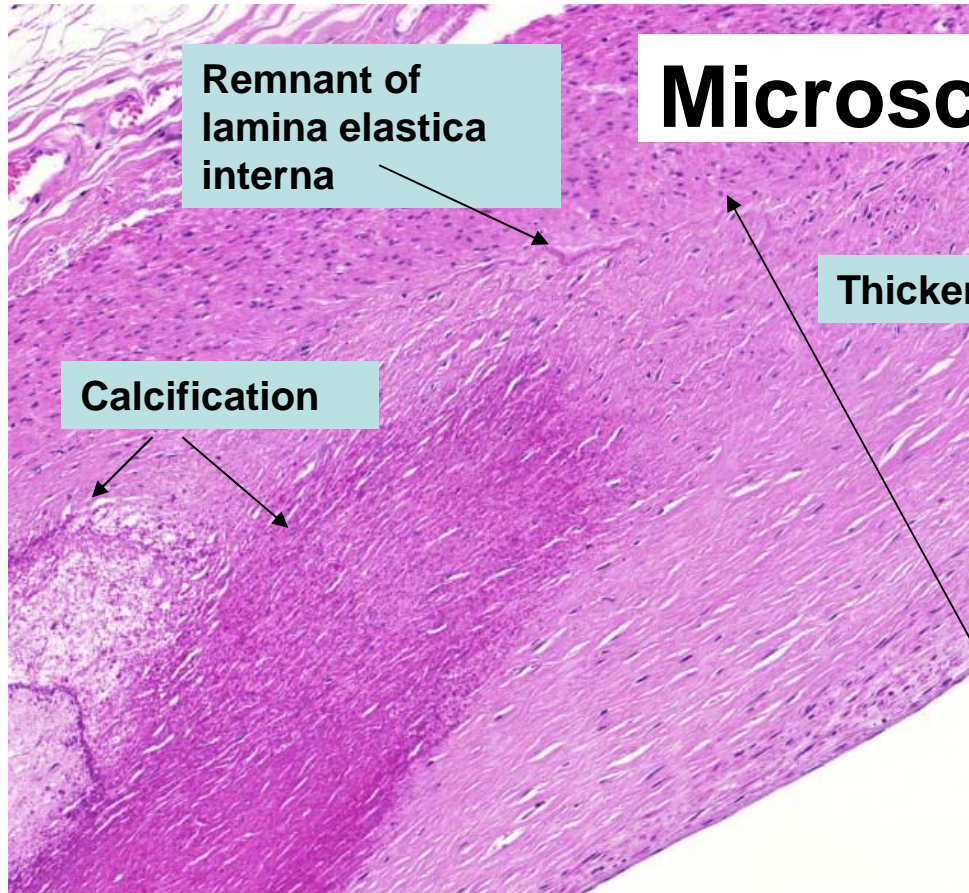
1. Fatty streak: foamy macrophages in the intima
2. Plaque stage: Outer layer: fibrosis. Inner core: cholesterol crystals, macrophages, calcification

Macroscopy

Example: complicated, thrombotic plaque



Microscopy



Acute myocardial infarction (recent-healed)

Macroscopy

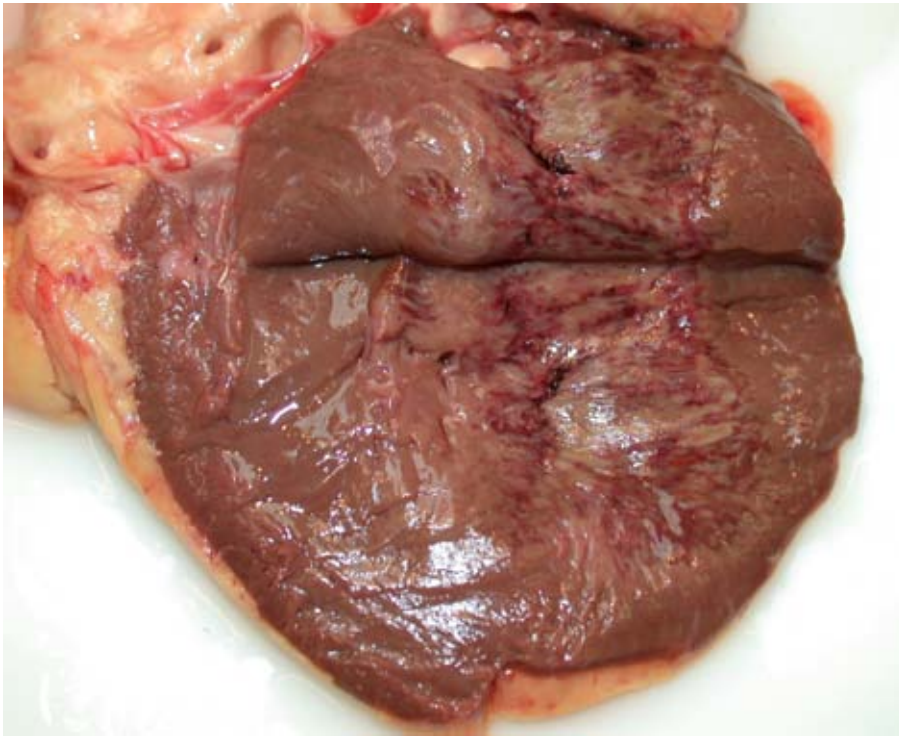
Localisation	Left ventricle. Localisation depends on the site of coronary occlusion. In case of diffuse myocardial ischemia, circumferential – subendocardial
Pattern	Transmural: geographical Subendocardial: diffuse
Colour	<18 hours: not visible. 1-3 days: pale, increasing hyperemic edge. 3-10 days: clay-yellow. >10 days: organization (brown), after 6 weeks greyish scar
Consistency	Elasticity lost, becomes friable, later firm scar
Other	In case of successful revascularisation (PCI) the infarcted area may become hemorrhagic!

Microscopy

1. Few hours: edema, wavy fibers, contraction streak
2. >24 hours: necrosis becomes complete (loss of nuclear staining and striation, hypereosinophilic cytoplasm), increasing neutrophilic infiltration
3. >72 hours: total desintegration of myocytes, organization begins from the edges
4. ~6 weeks: formation of definitive scar

Macroscopy

Examples of a recent and a healed myocardial infarct



RECENT



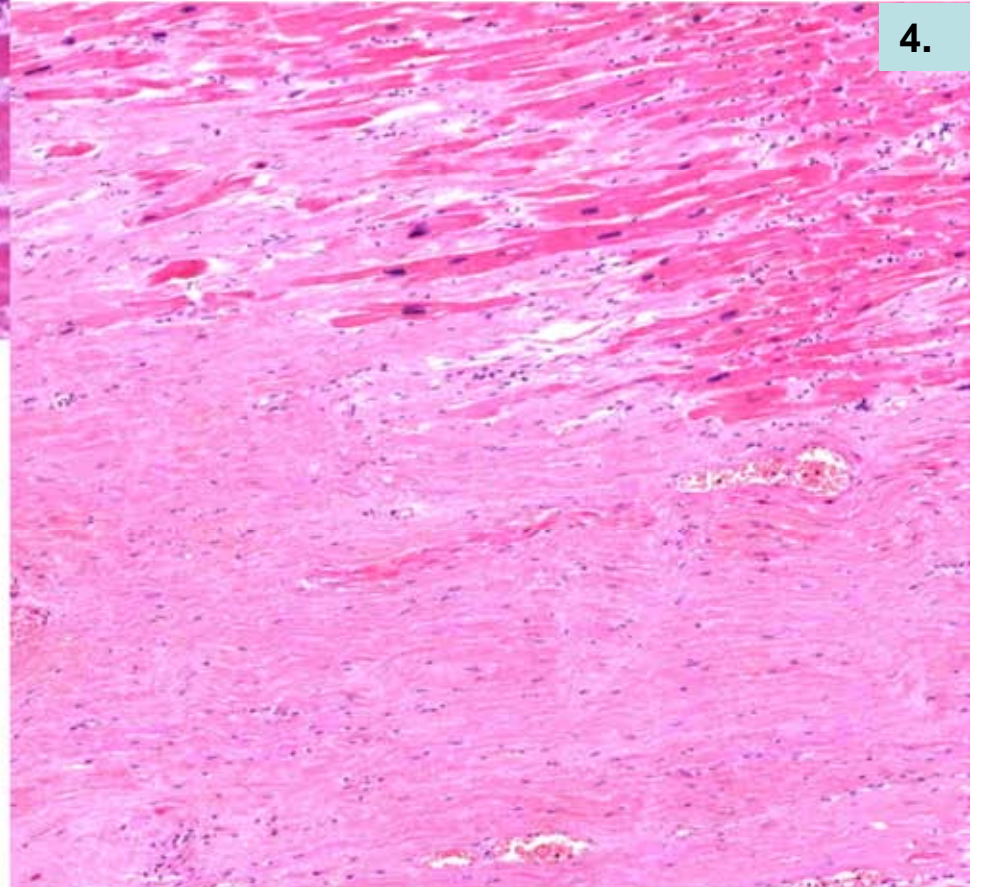
HEALED

2-3.

Microscopy



4.



Acute infective endocarditis

Macroscopy

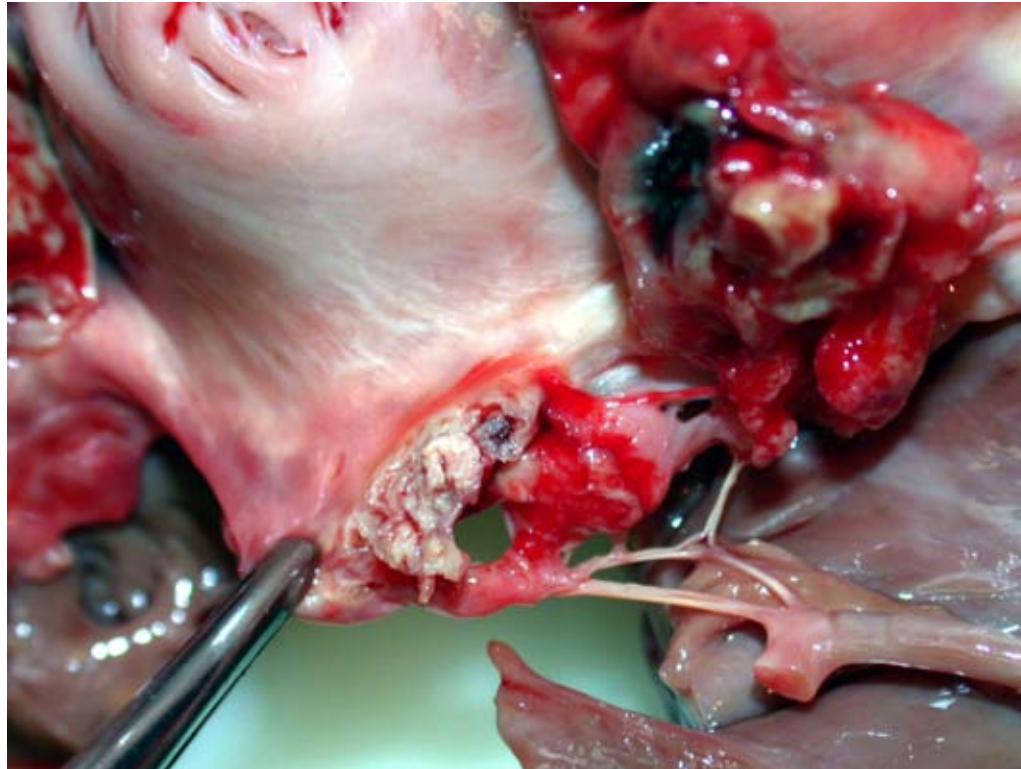
Localisation	Heart valves
Pattern	Vegetation: thrombus formed by fibrin and bacteria
Colour	Yellowish - grey
Consistency	Soft
Other	Complications: Valve destruction: insufficiency, regurgitation; „Septic embolisation”= (systemic: brain-spleen-kidney abscess; pulmonary: lung abscess)

Microscopy

1. Fibrin (eosinophilic)
2. Bacteria (basophilic)
3. Neutrophilic infiltration inconspicuous
4. To note: Due to lack of valvular vasculature the organization is very slow.

Macroscopy

Vegetation causing rupture of the bicuspid valve



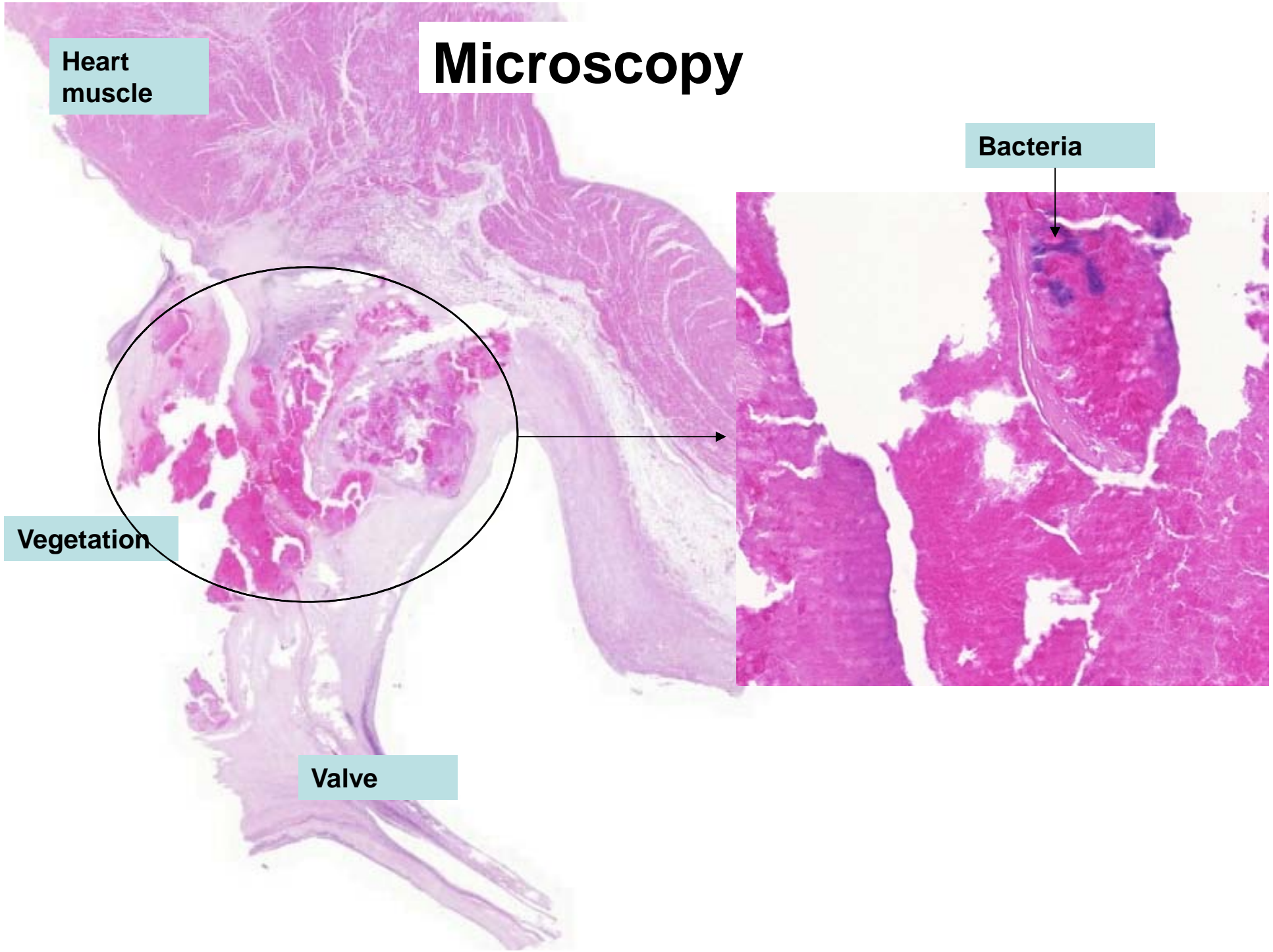
Microscopy

Heart muscle

Vegetation

Valve

Bacteria



IRDS

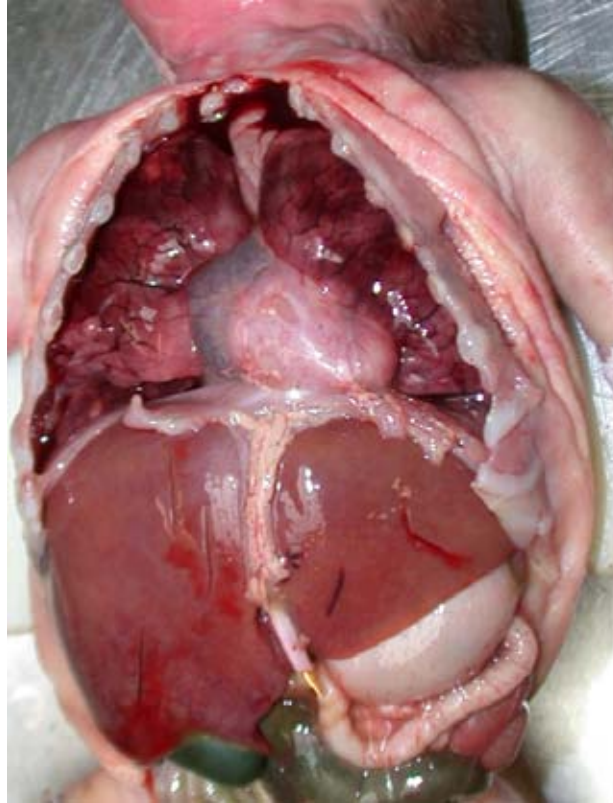
Macroscopy

Localisation	Both lungs
Pattern	Diffuse
Colour	Patchy red
Consistency	Firm, heavy, airless parenchyma
Other	Water probe: the airless piece of the lung sinks in the water (the normal lung would float)

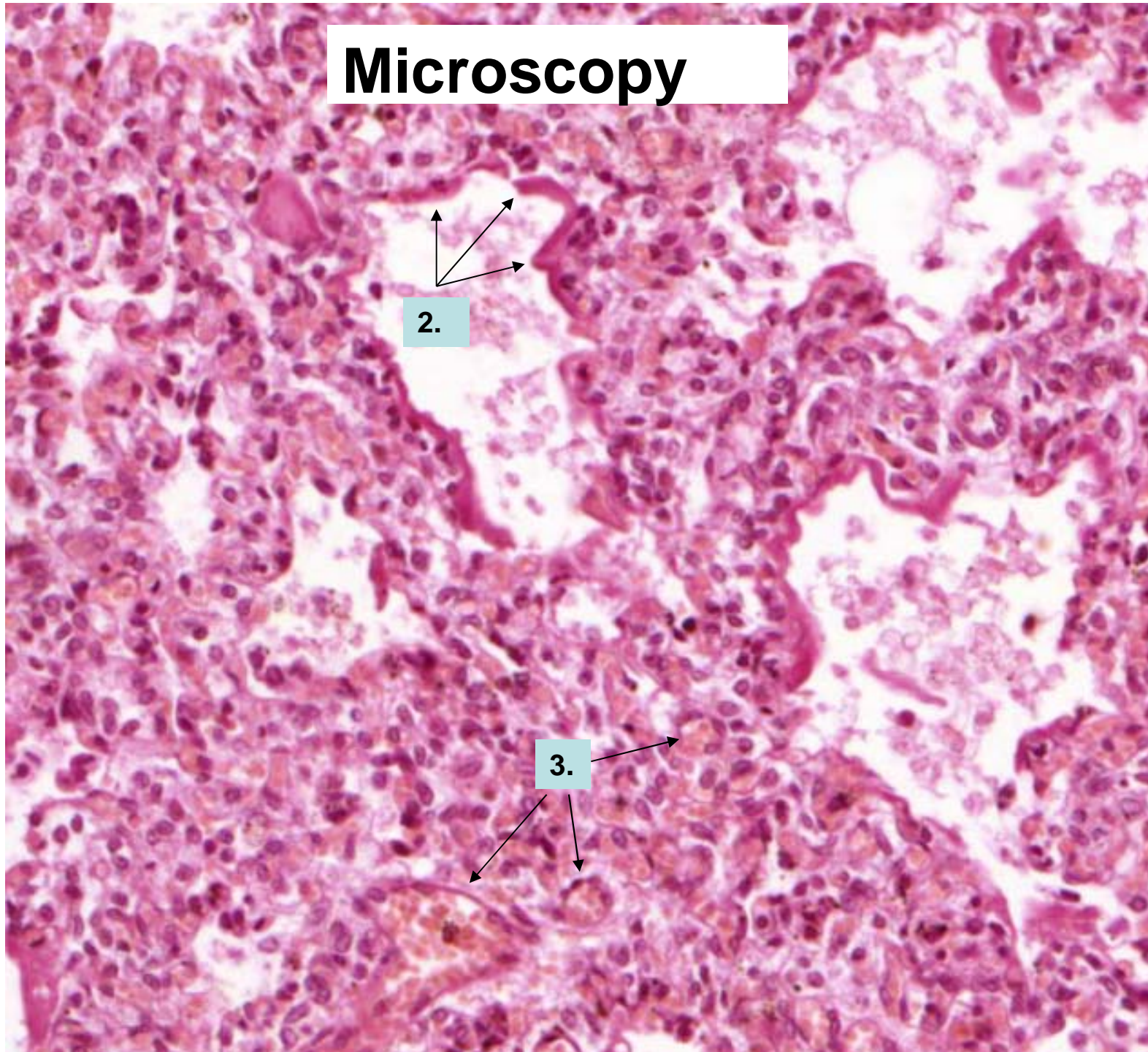
Micro

1. Airless parenchyma, collapsed alveoli
2. Hyalin membranes (protein rich layer in the alveoli; PAS positive)
3. Stasis

Macroscopy



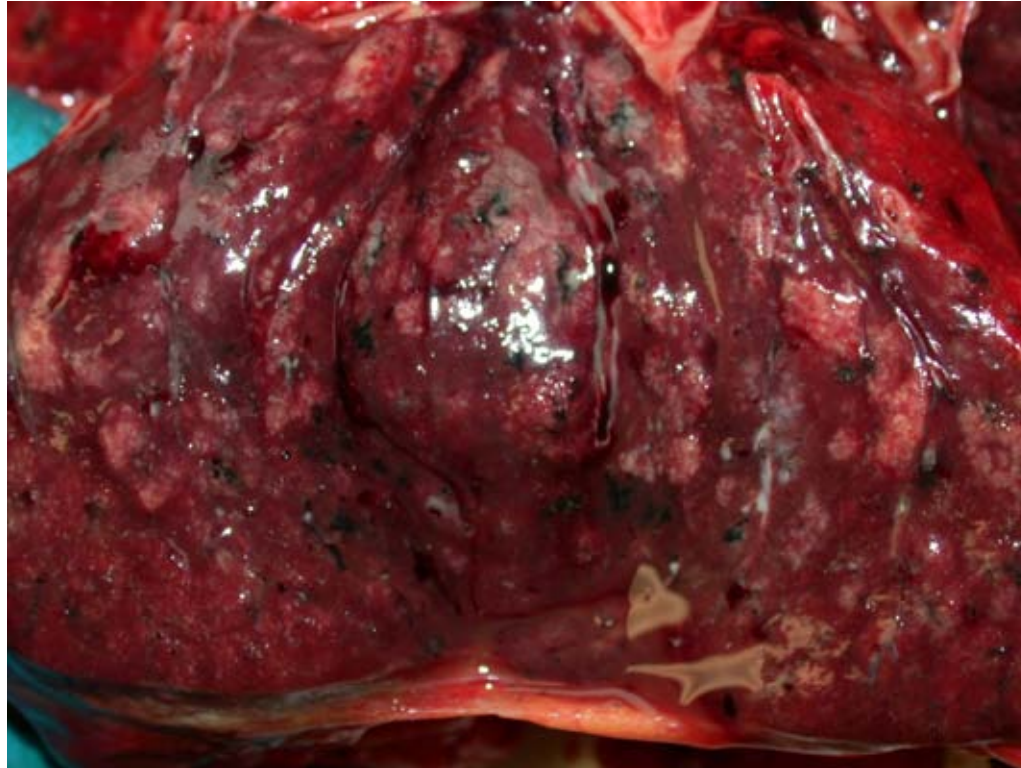
Microscopy



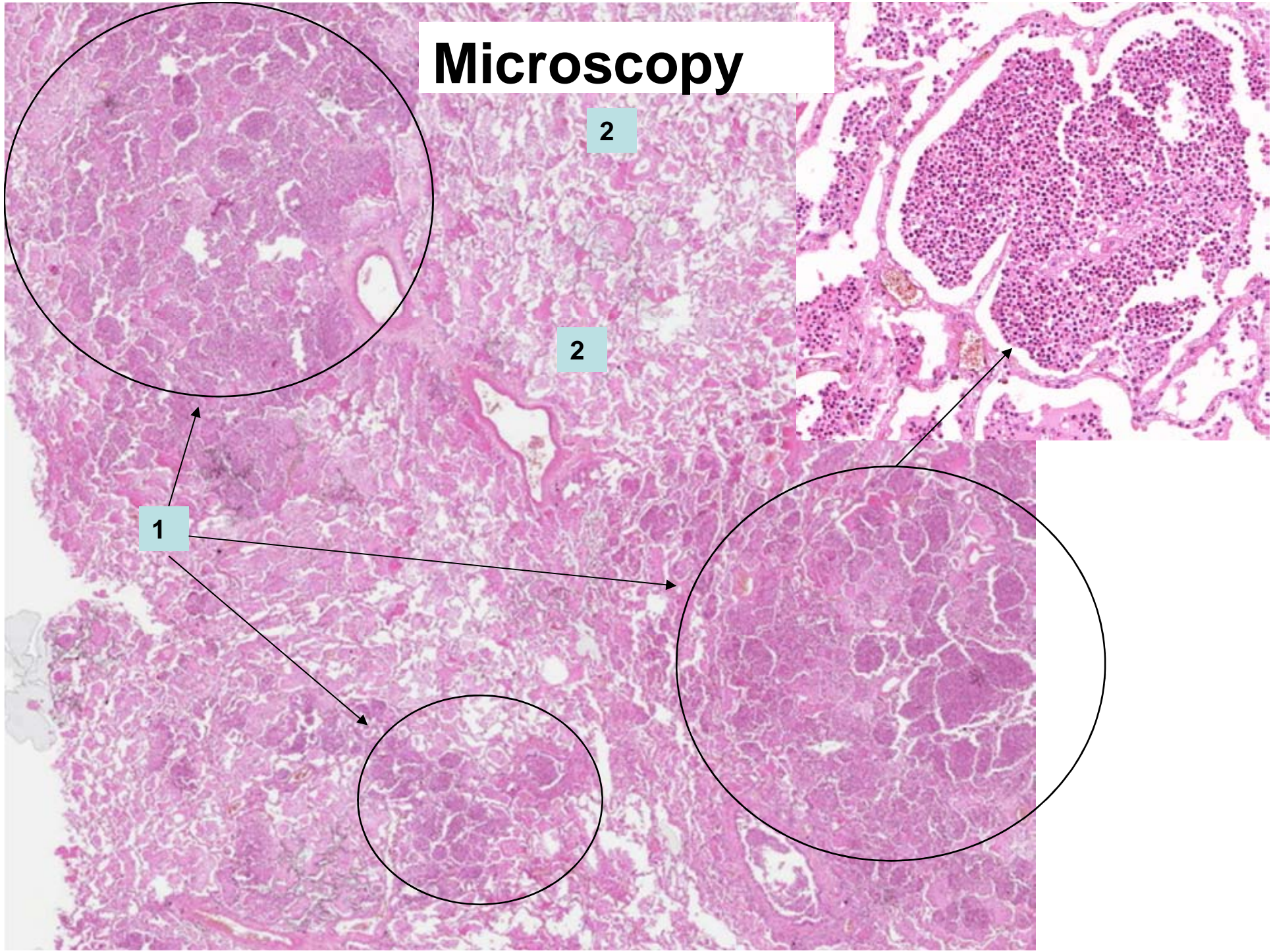
Bronchopneumonia

Macroscopy	
Localisation	Uni- or bilateral
Pattern	Patchy
Colour	Yellow patches (=pus) within the red parenchyma (=hyperemia)
Consistency	Firm, friable
Other	On the pleural surface above the inflammation fibrinous pleuritis
Microscopy	
1.	Purulent exsudate (=neutrophilic granulocytes) fills the alveoli
2.	Surrounding parenchyma shows edema and hyperemia

MacroscoPy



Microscopy



Miliary tuberculosis of the lung

Macroscopy

Localisation	Bilateral
Pattern	Diffusely small flecks
Colour	Yellowish flecks (more sharp than in bronchopneumonia)
Consistency	Less friable parenchyma, soft yellow material in caseous foci
Other	Circumscribed form of TB: caverna

Microscopy

Necrotising granulomatous inflammation

1. Structure of caseous granuloma (from core toward periphery): necrosis-epithelioid macrophages-lymphocytic rim+fibrosis
2. Langhans giant cells (multinucleated giant cells, the nuclei are arranged in a semilunar or circular fashion)

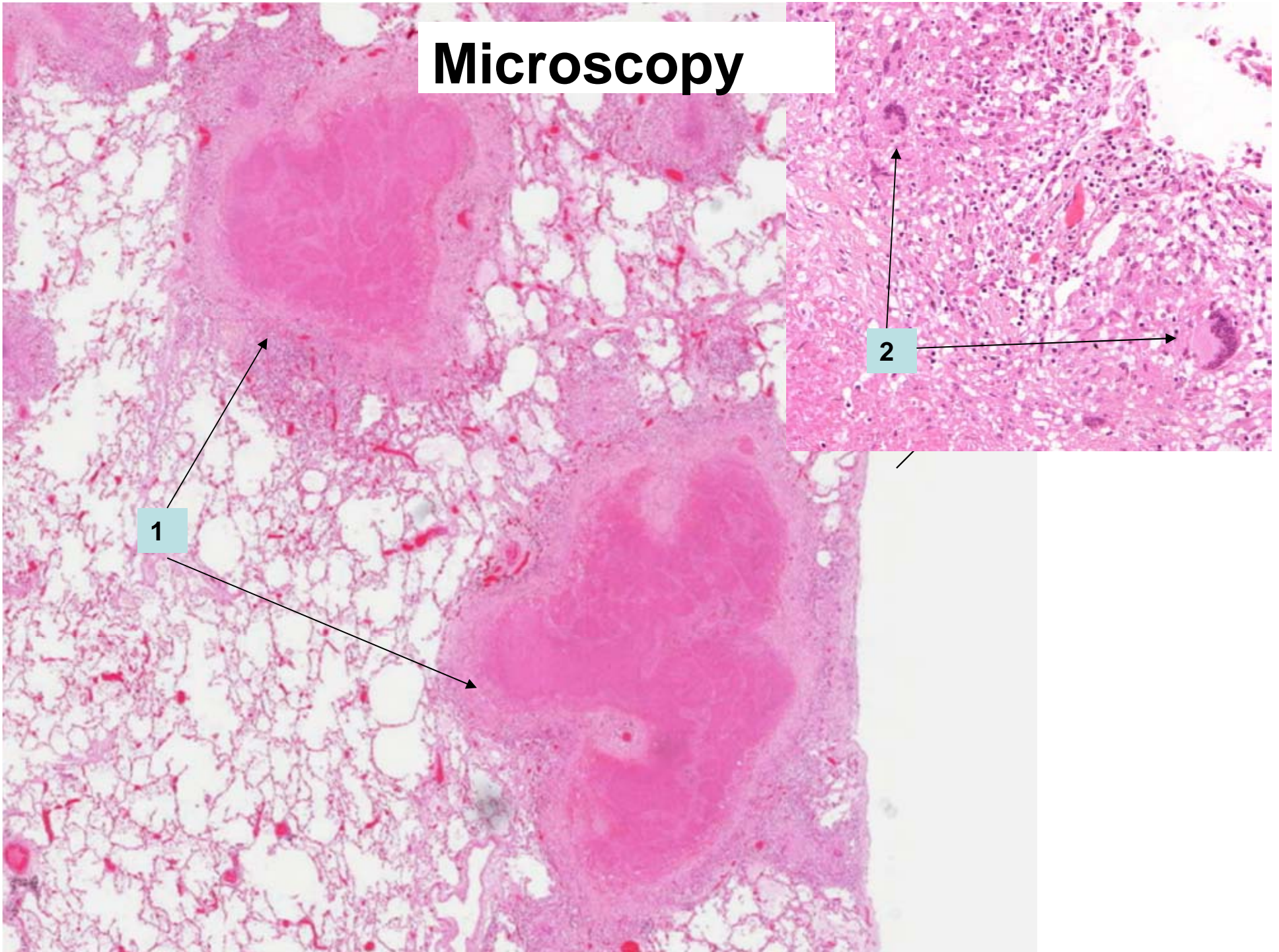
Identification of Mycobacterium tuberculosis in tissues: Ziehl-Neelsen stain! (red rods)

Macroscopy

(The picture shows a case of cavernous tuberculosis)

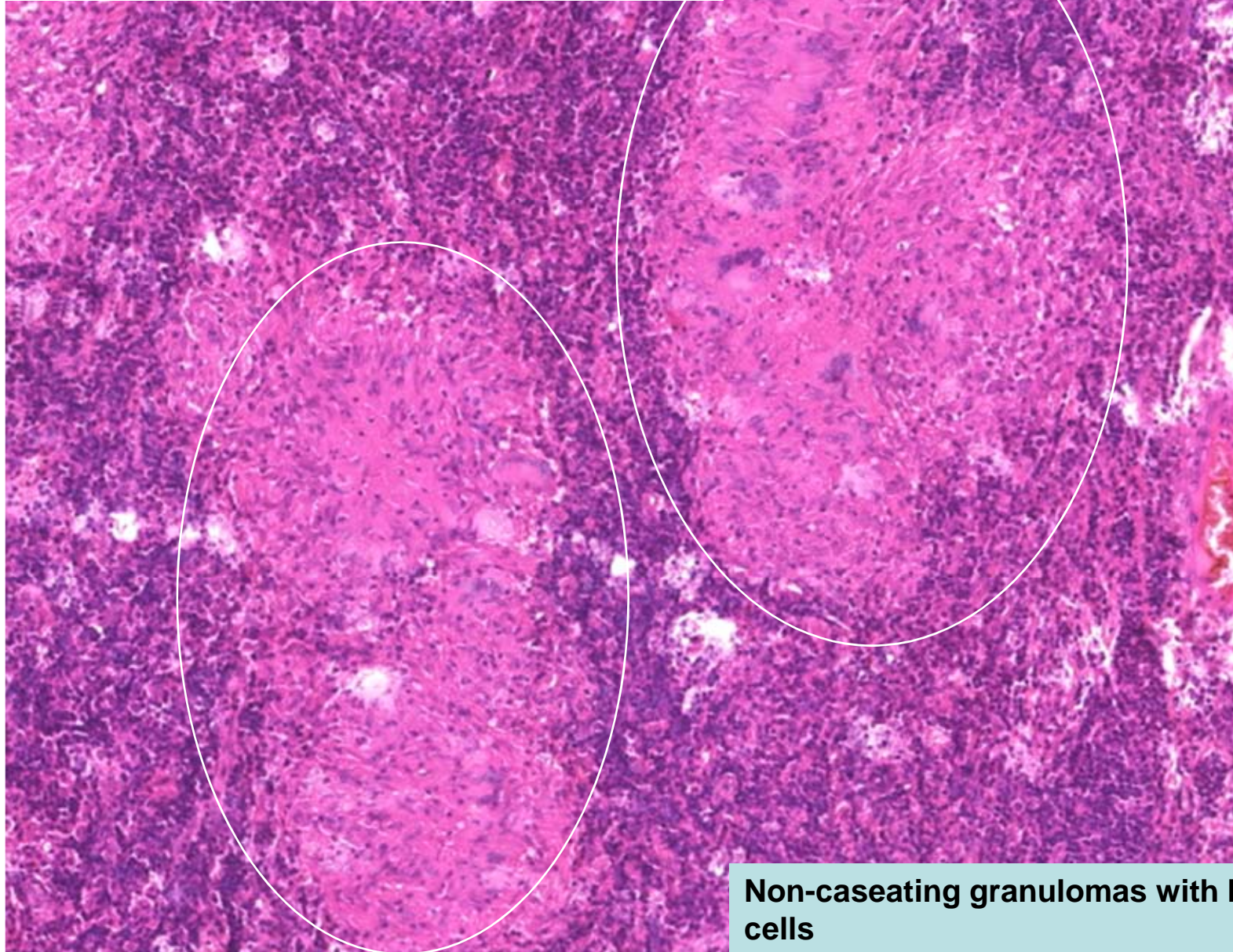


Microscopy



Microscopy

SARCOIDOSIS (lymph node)



Non-caseating granulomas with Langhans giant cells

Carcinoma pulmonis

Macroscopy

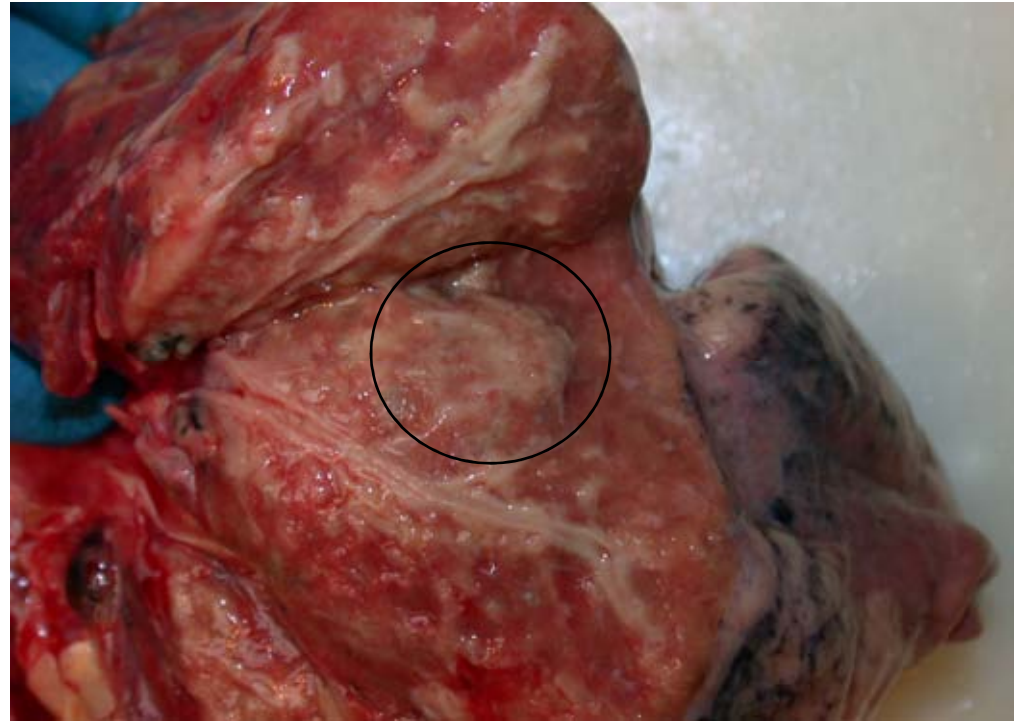
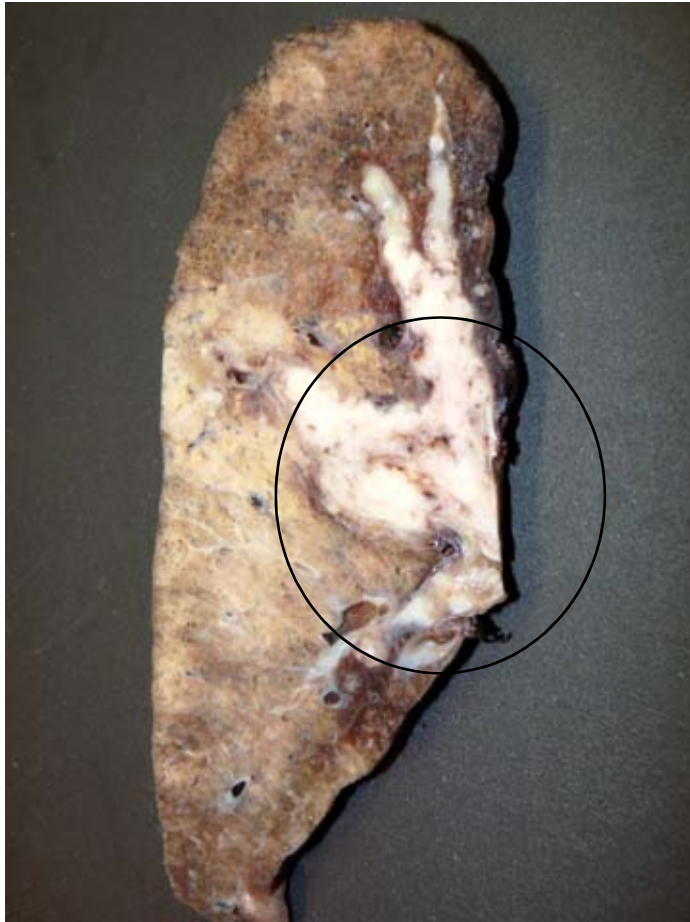
Localisation	Central (small cell cc + squamous cell cc) or peripheral (adenocarcinoma)
Pattern	Nodule with irregular edge
Colour	greyish
Consistency	Firm
Other	May occur in occult form (metastases are discovered before the primary tumor is found)

Microscopy

1. Carcinoma microcellulare (small/oat cell carcinoma) = undifferentiated neuroendocrine carcinoma: small, polymorphic hyperchromatic cells, abundant mitotic figures, diffusely infiltrative pattern, necroses.
2. Carcinoma planocellulare (squamous cell carcinoma): larger cells, squamoid differentiation (keratinizing or non-keratinizing), nested pattern.
3. Adenocarcinoma: glandular differentiation (some cases with mucin production).
Lepidic spread= alongside the inner surface of the alveoli.

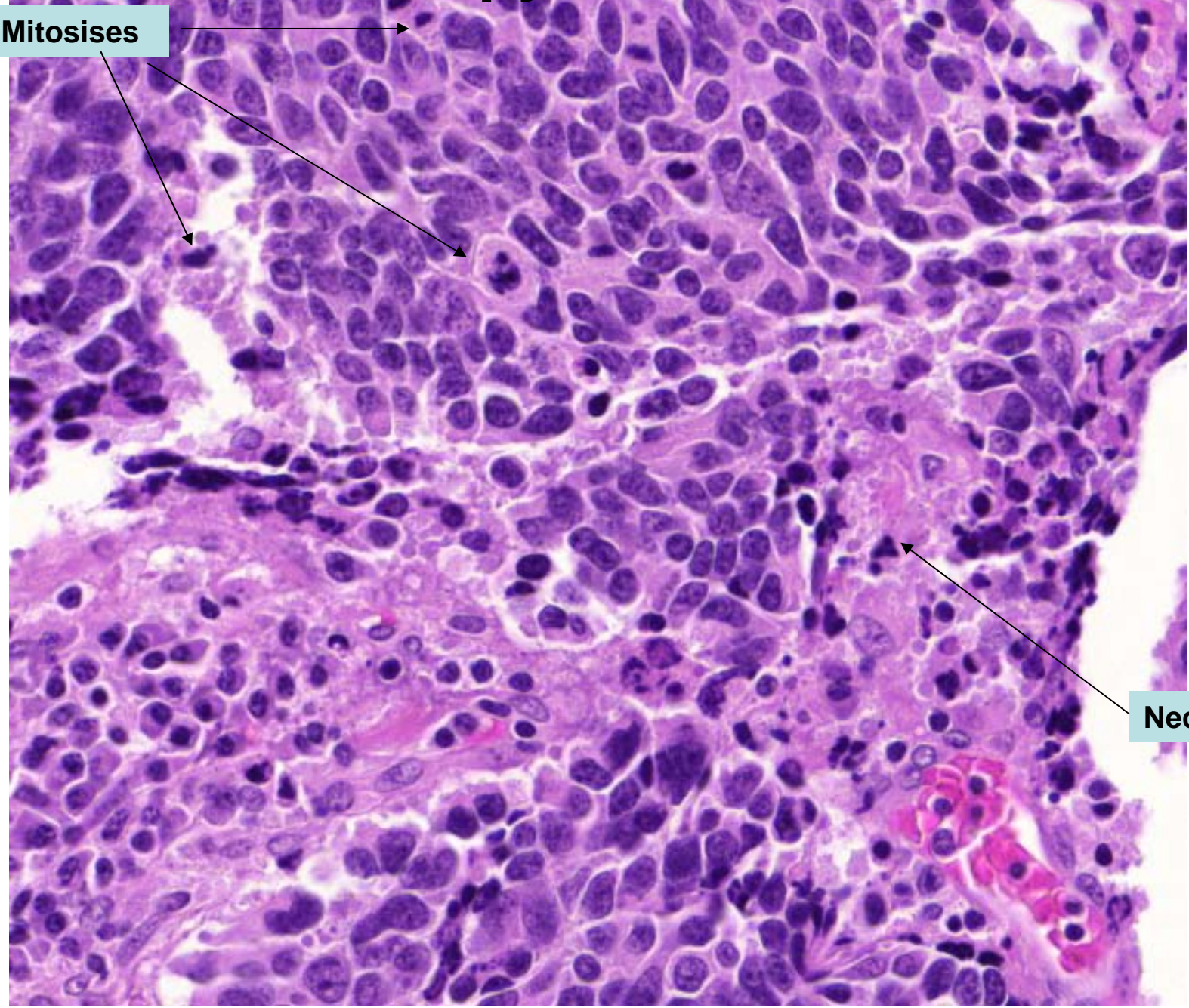
Macroscopy

(Examples for a central (left) and a peripheral (right) lung carcinoma)



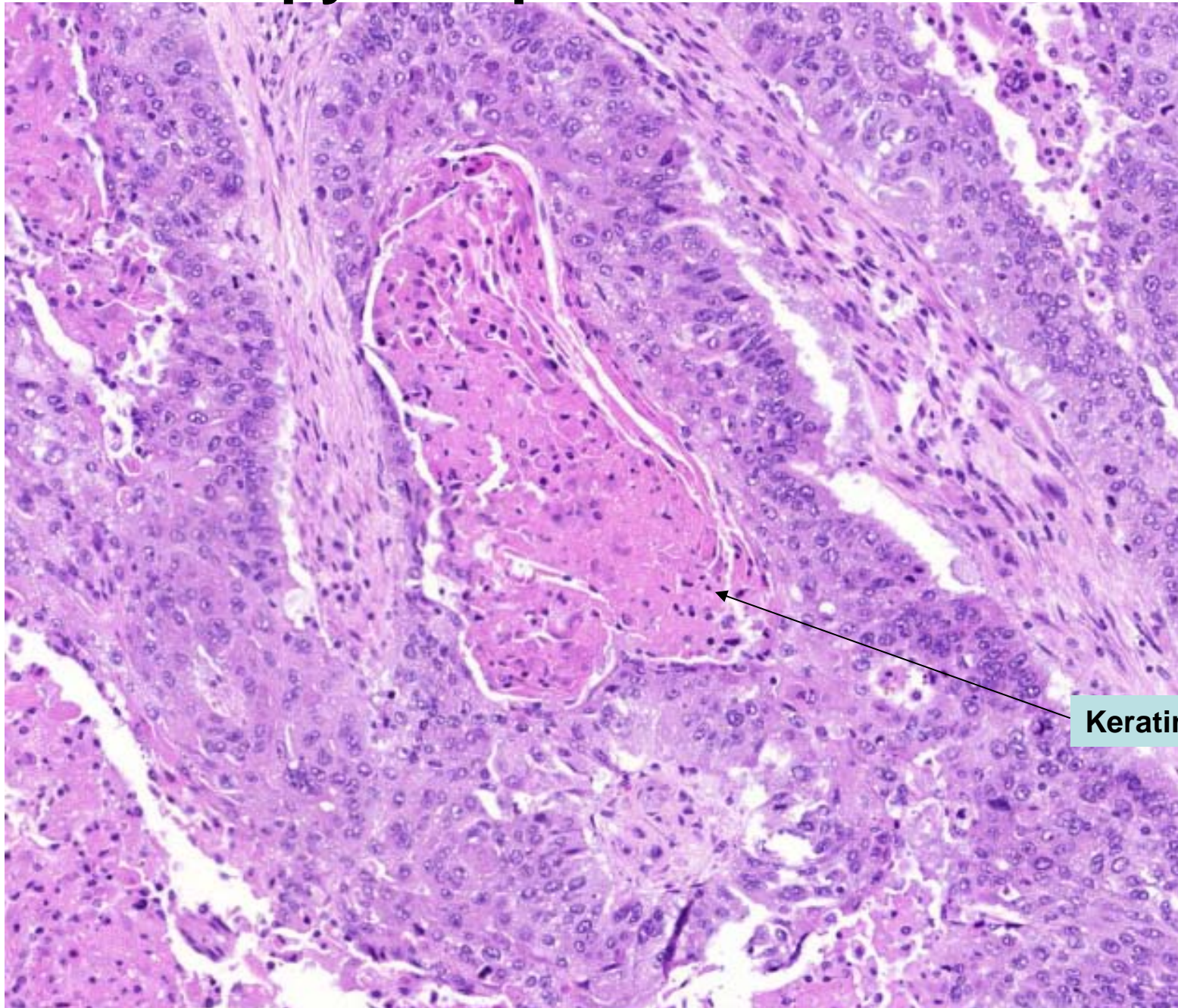
Microscopy 1. Small cell carcinoma

Mitoses



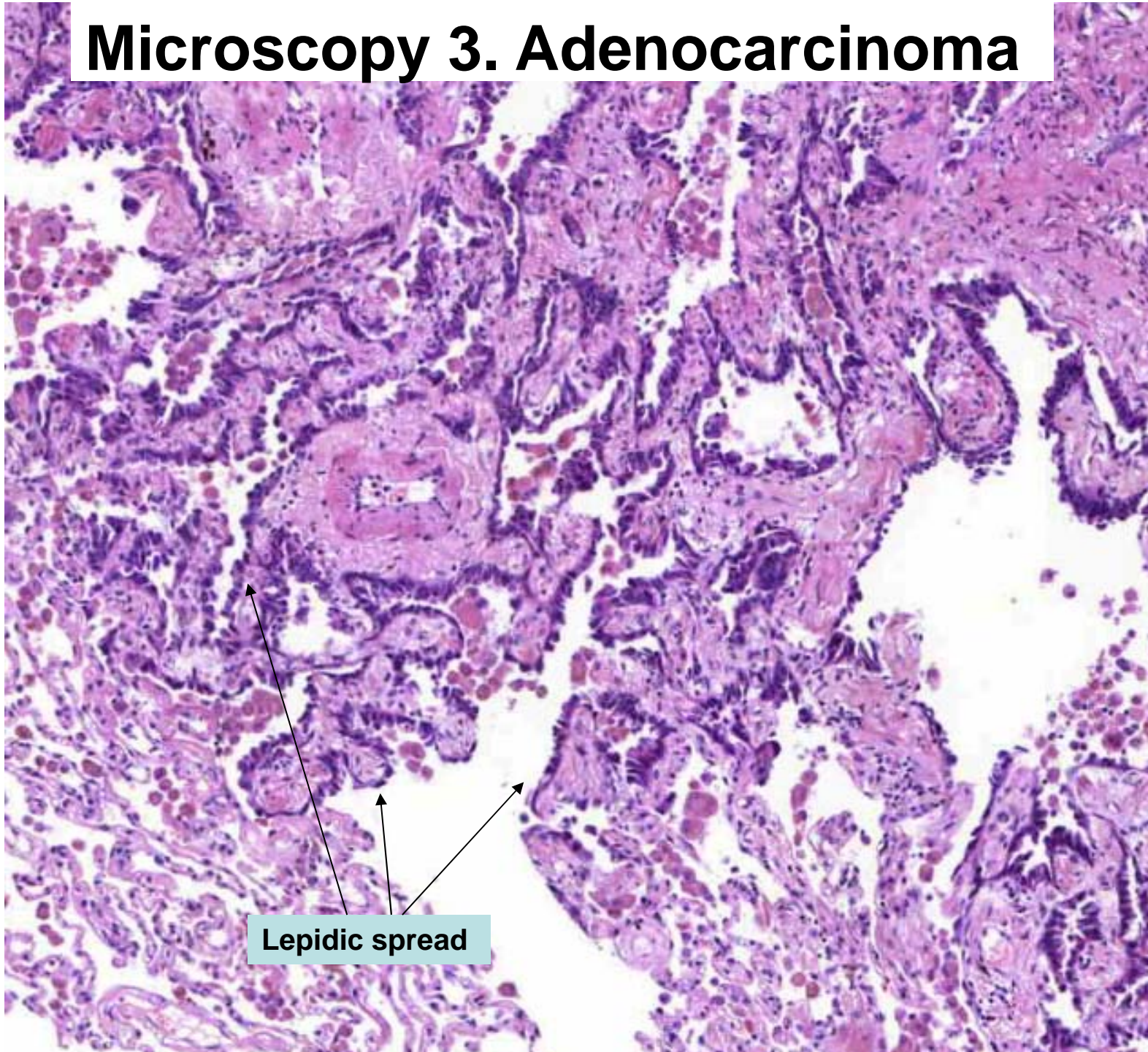
Necrosis

Microscopy 2. Squamous cell carcinoma



Keratin

Microscopy 3. Adenocarcinoma



Mesothelioma

Macroscopy

Localisation	Pleura/peritoneum
Pattern	Like an armor, encases the thoracic and/or abdominal organs (less commonly it can be localized). Rarely invades the parenchyma.
Colour	Greyish
Consistency	Firm
Other	

Microscopy

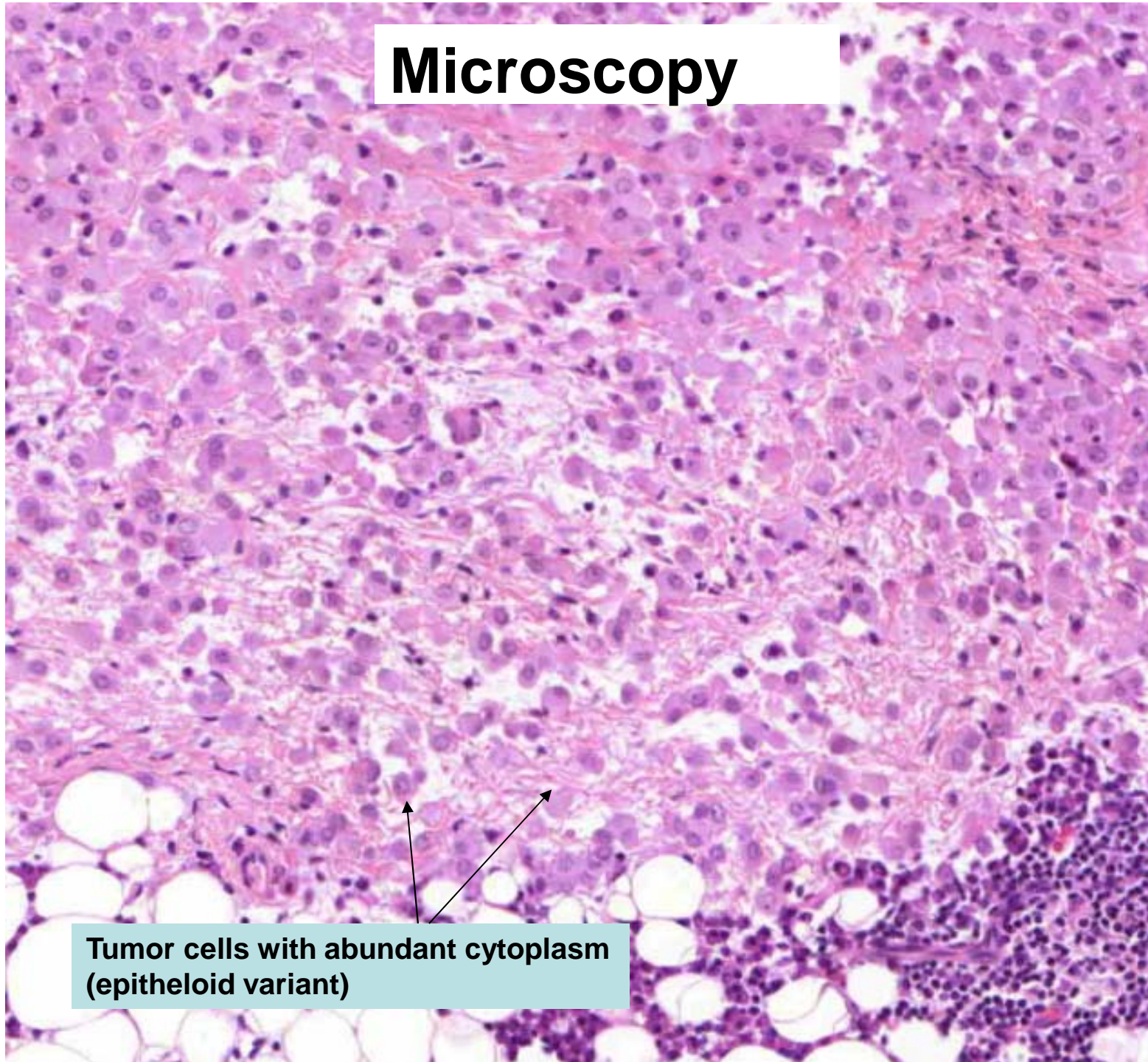
1. Spindle cell variant=sarcomatoid;
2. Epitheloid variant=epitheloid (solid/papillaris/pseudoglandularis)

Macroscopy



Source: <http://btmexchange.com/care-giving-for-mesothelioma-cancer-sufferers/>

Microscopy



Tumor cells with abundant cytoplasm
(epithelioid variant)

Pleomorphic adenoma of the parotid gland

Macroscopy

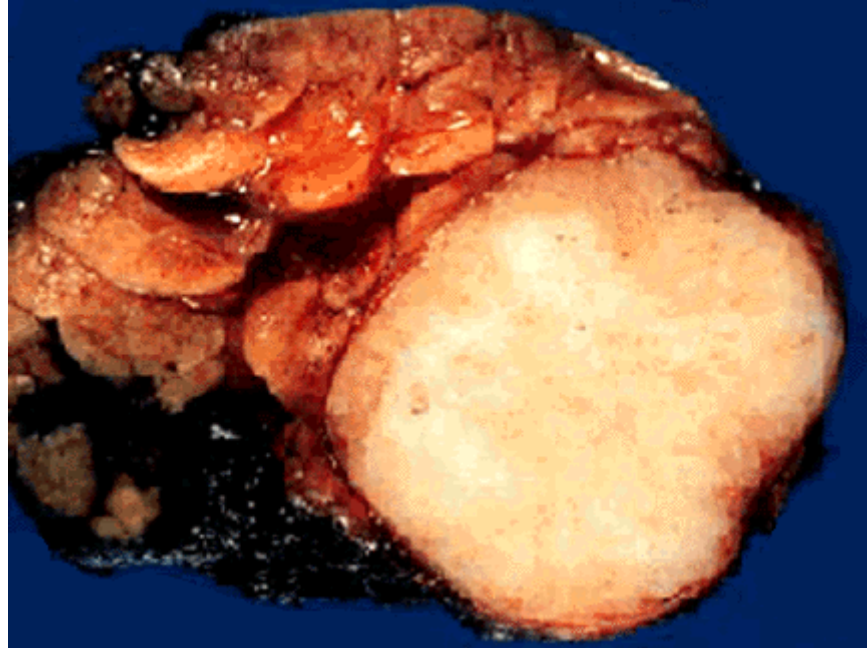
Localisation	Large salivary glands
Pattern	Grossly well circumscribed tumor with capsule
Colour	Greyish, shiny
Consistency	Rubbery
Other	The tumor may grow through the capsule – tendency to recur

Microscopy

Myoepithelial tumor showing bidirectional differentiation:

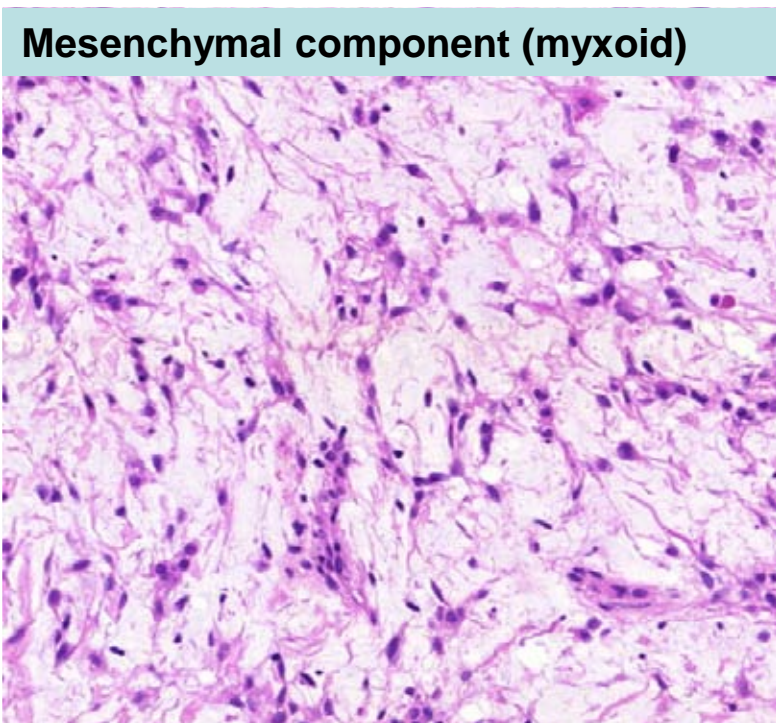
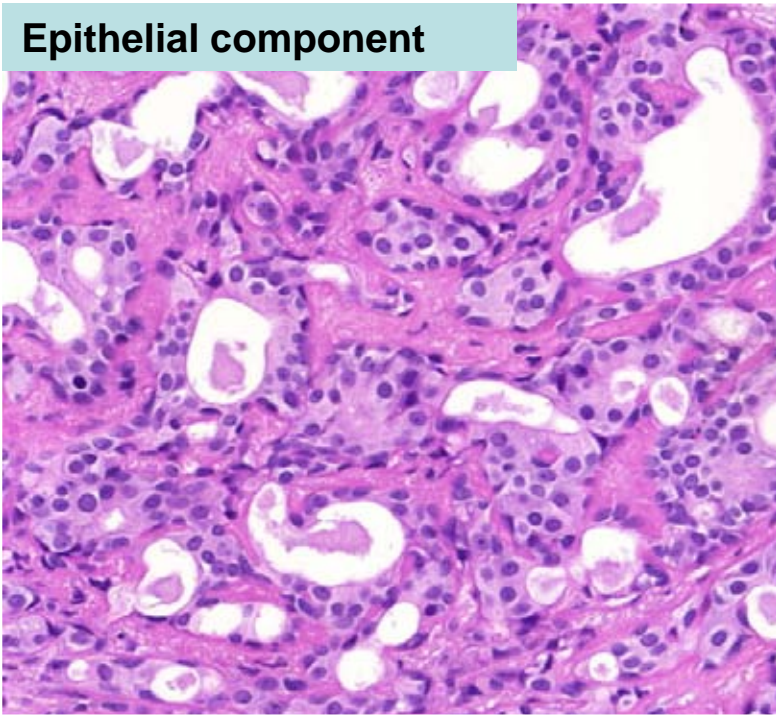
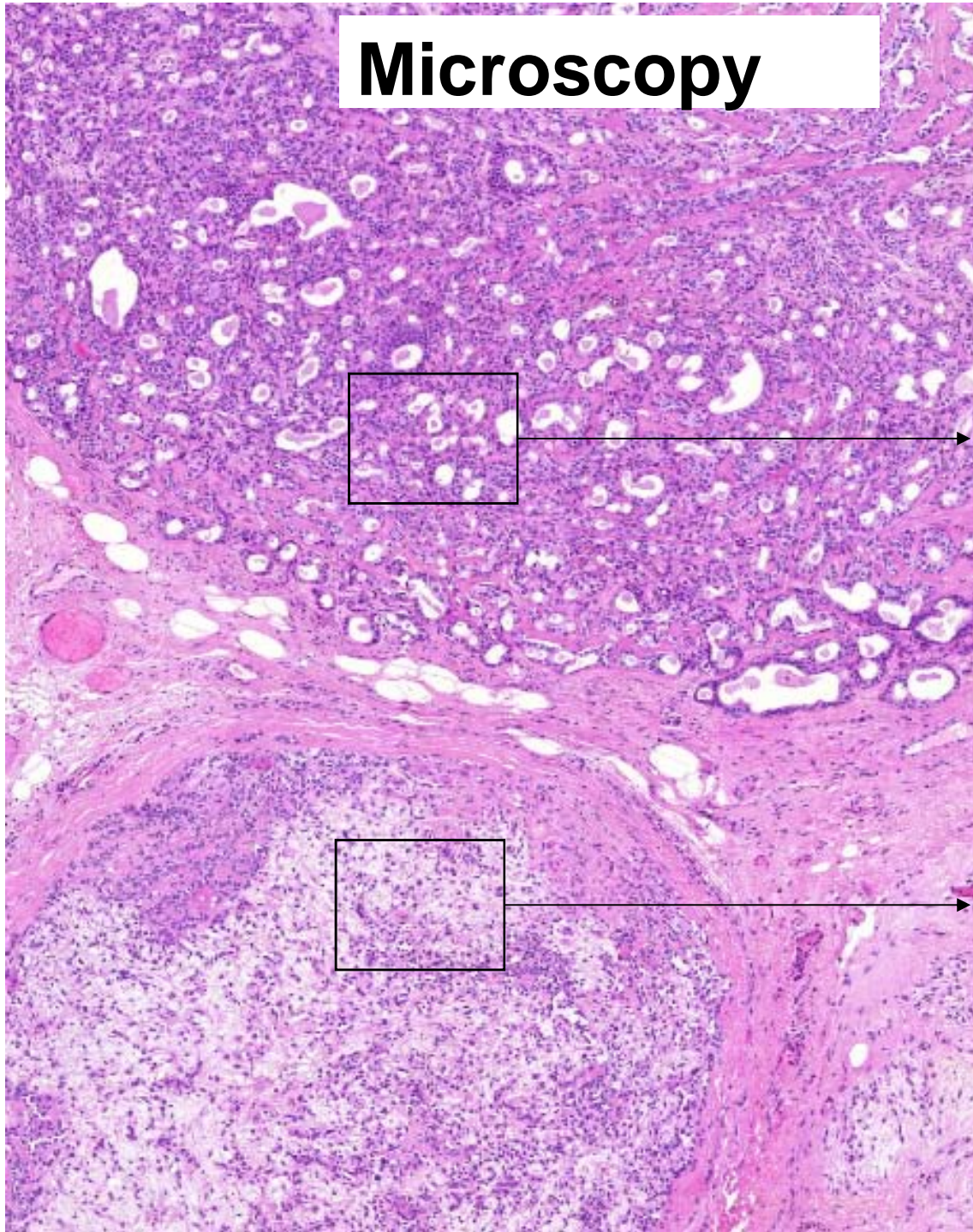
- epithelial (=ductal structures)
- mesenchymal stroma (loose/myxoid connective tissue, chondroid areas may be present)

Macroscopy



Source: <http://155.37.5.42/eAtlas/GI/132.htm/>

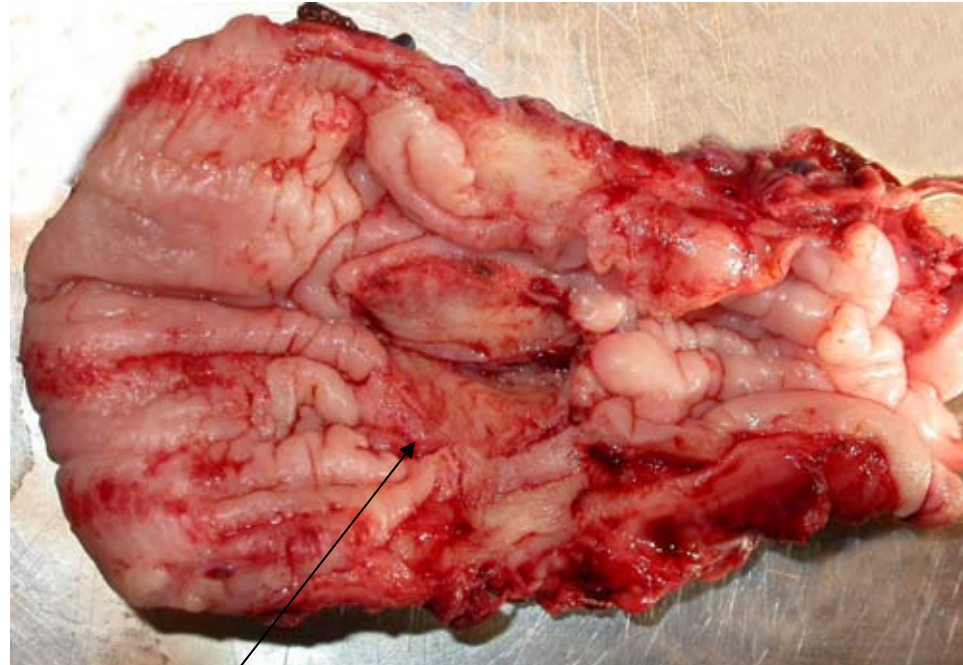
Microscopy



Carcinoma planocellulare (squamous cell cc) oesophagi

Macroscopy	
Localisation	Generally mid – lower third of the esophagus
Pattern	Poorly circumscribed, exulcerated tumor
Colour	Greyish
Consistency	Firm
Other	
Microscopy	
See: uterine cervix	

MacroscoPy

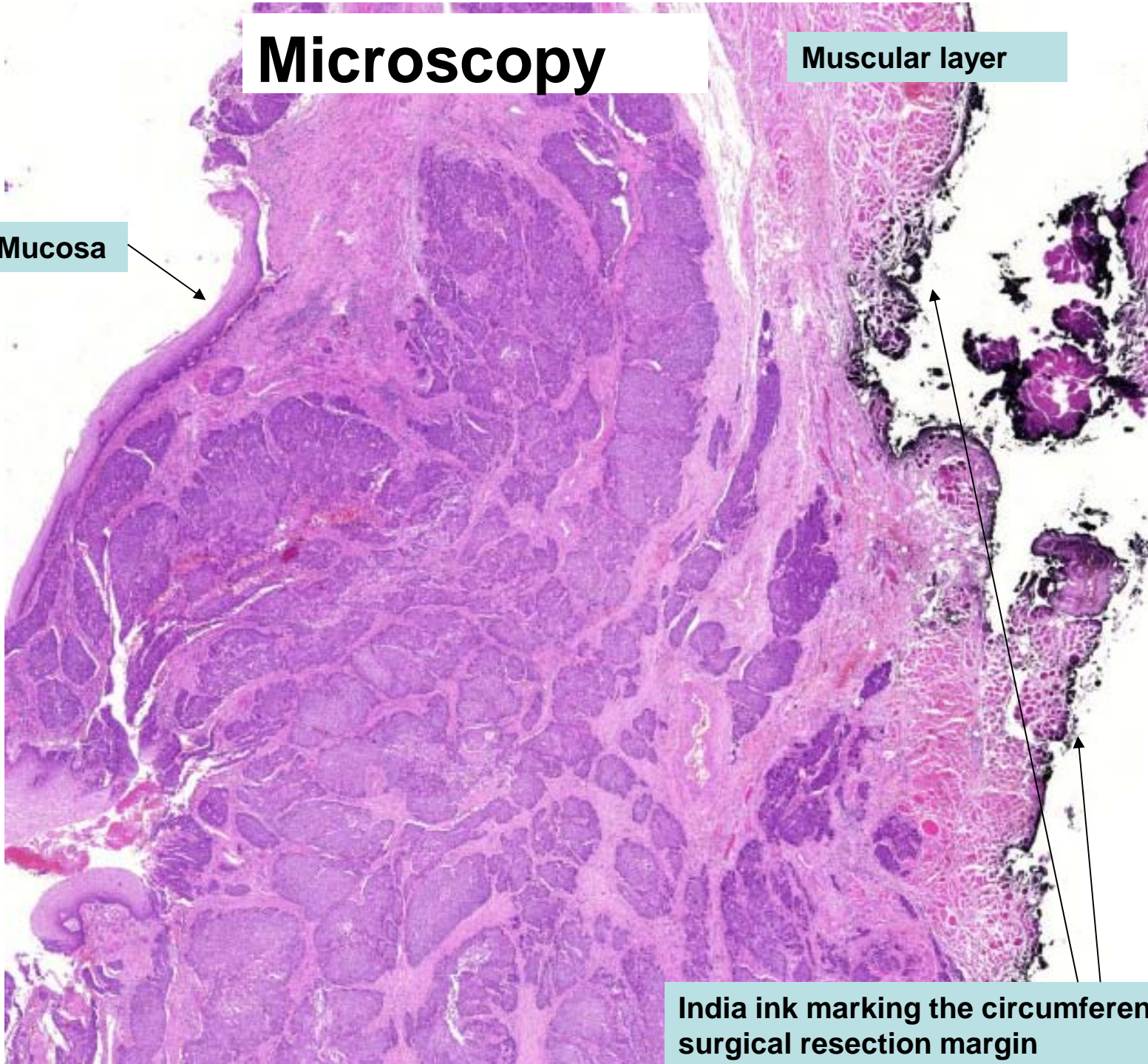


Exulcerated tumor

Microscopy

Mucosa

Muscular layer



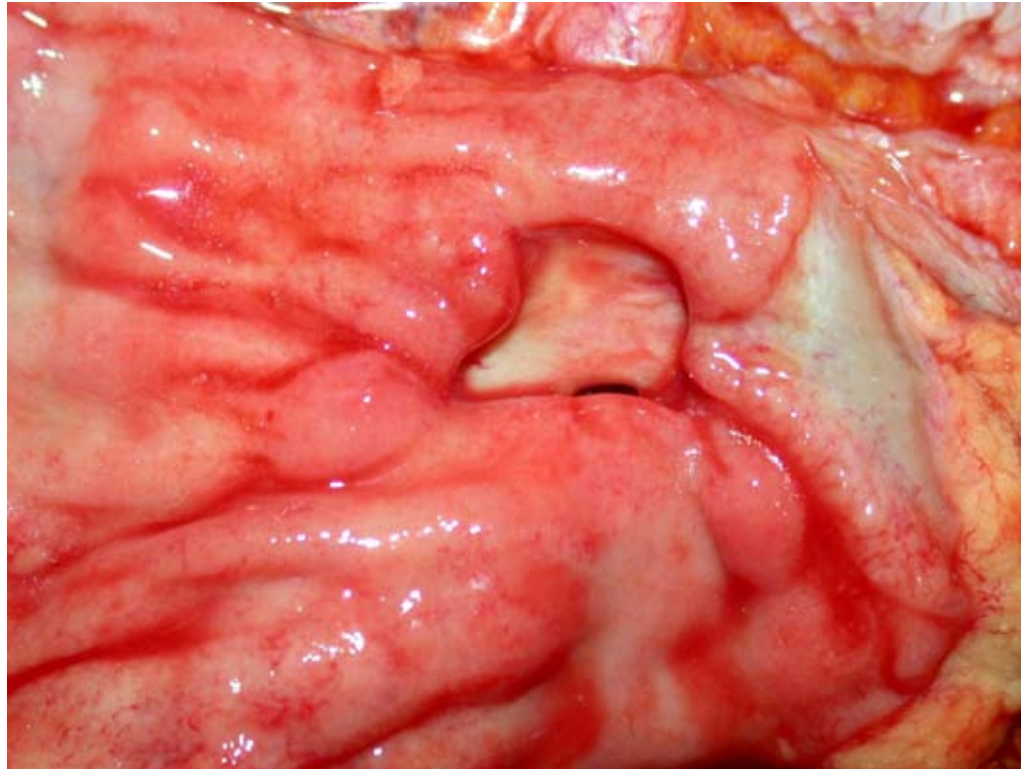
India ink marking the circumferential surgical resection margin

Ulcus pepticum ventriculi (gastric ulcer)

Macroscopy	
Localisation	Occurrence in decreasing order of frequency: bulbus duodeni-antrum-corporis
Pattern	Solitary or multiple sharply circumscribed, smooth borders, mucosal margin may overhang the base, mucosal folds radiate from the ulcer in spoke-like fashion
Colour	Acute-black (digested blood), chronic-grey
Consistency	The base is firm
Other	
Microscopy	
1.	Layers (from top): <ul style="list-style-type: none">a) necrosis+blood clot+granulocytesb) granulation tissue (proliferating capillaries, fibroblasts)c) scar tissue (connective tissue rich in collagen fibres)
2.	Along the edge the mucosa shows inflammation with reactive epithelial changes (enlarged, hyperchromatic nuclei, prominent nucleoli, decreased mucin content)

Macroscopy

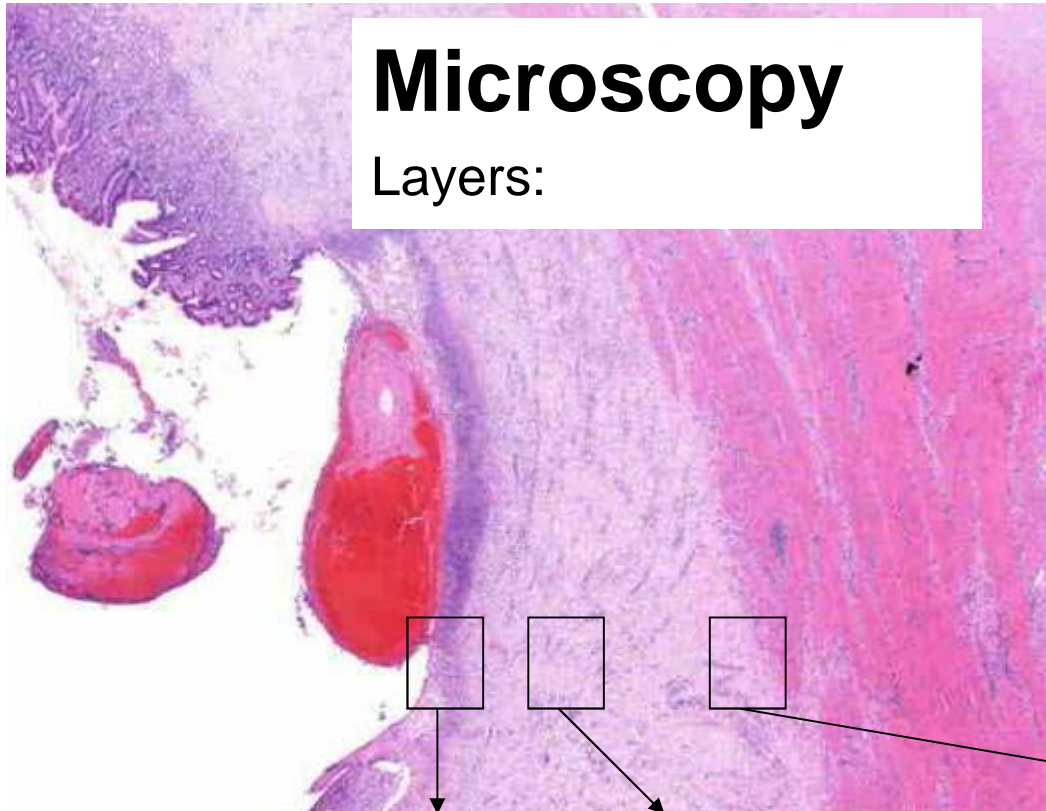
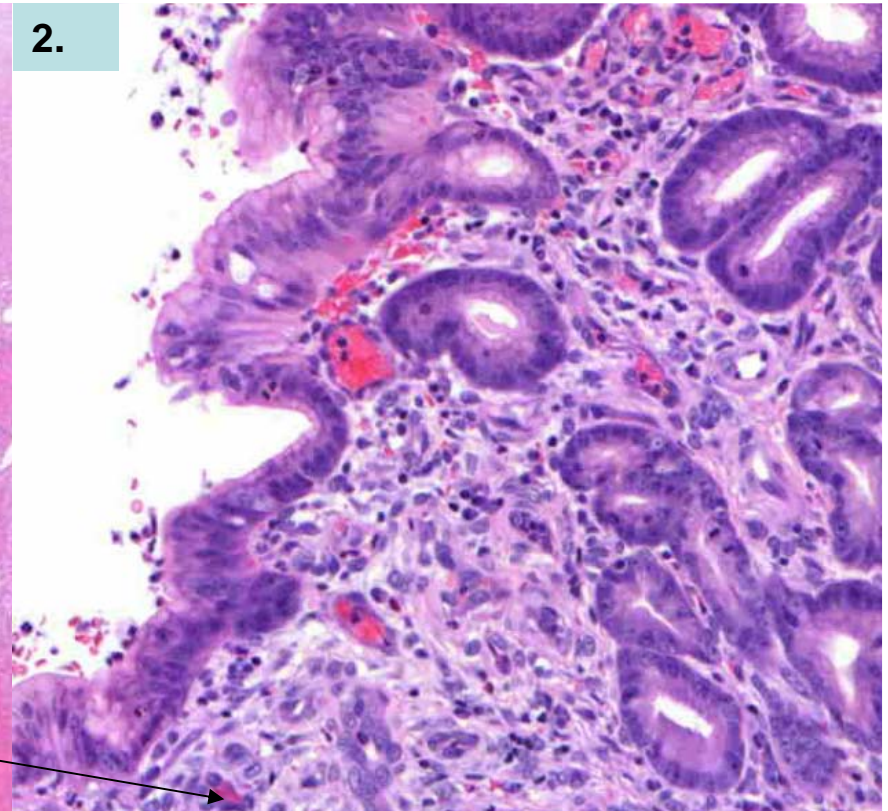
Differential diagnosis: carcinoma!! The ulcer base is smooth, the mucosal edge overhangs



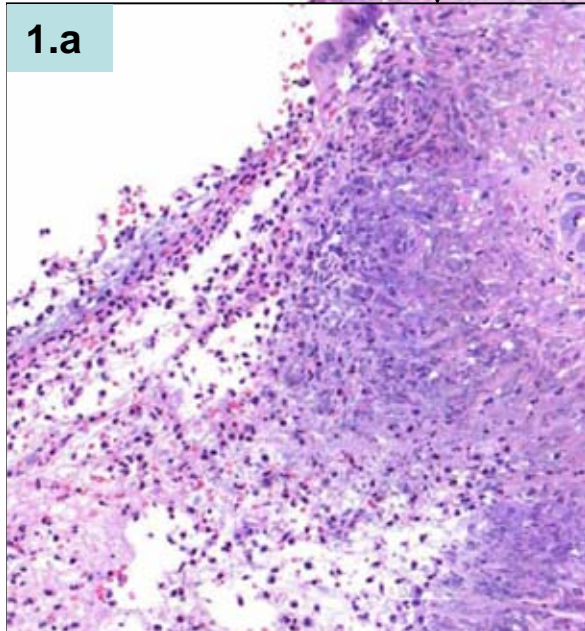
Microscopy

Layers:

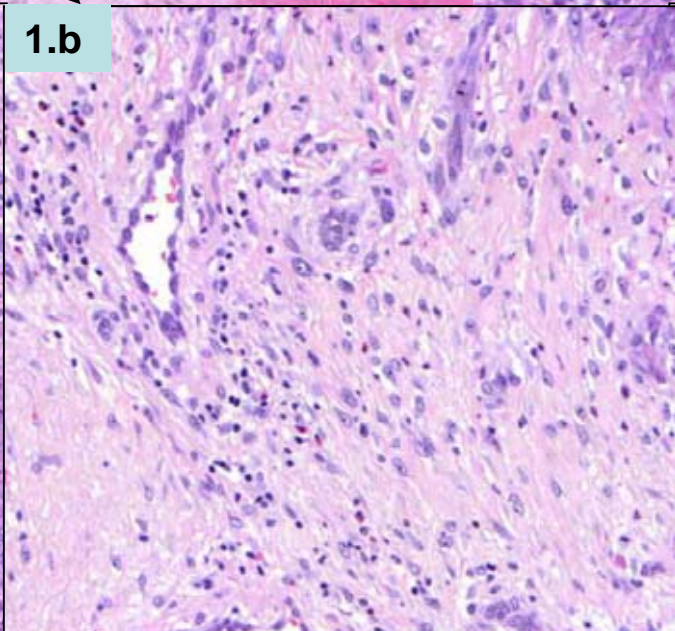
2.



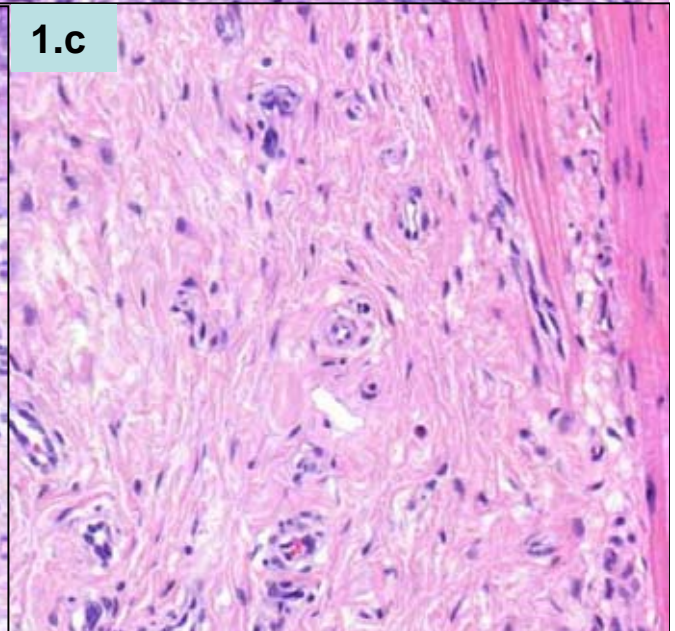
1.a



1.b



1.c



Gastritis chronica, H. pylori+

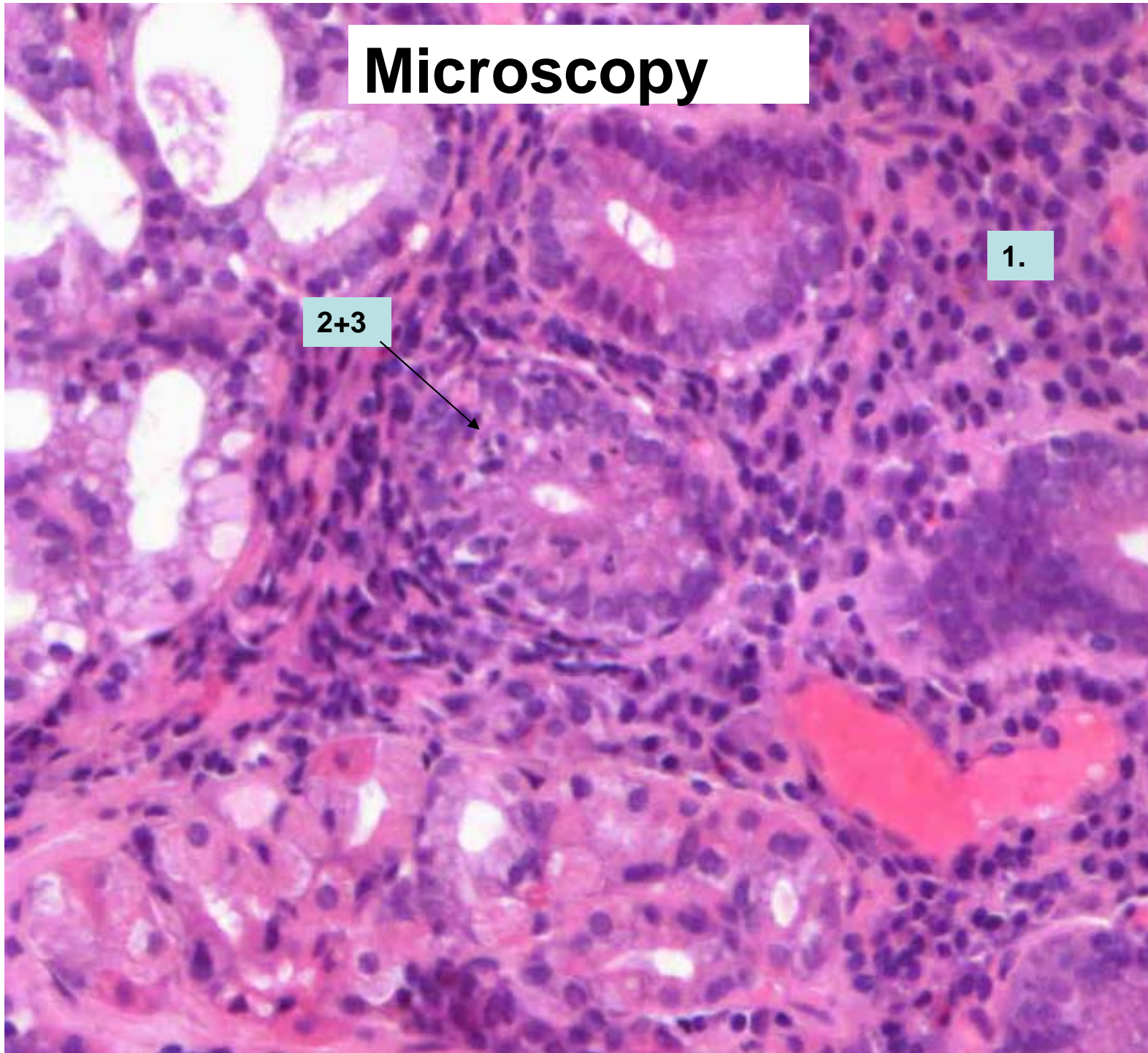
Macroscopy

Localisation	Mostly the antrum is affected
Pattern	Diffuse
Colour	Patchy hyperemia
Consistency	
Other	

Microscopy

1. Diffuse lymphoplasmocytic infiltrate in the antral mucosa
2. Activity= granulocytic infiltration of the foveolar epithelium
3. Reactive atypia in the epithelium = decreased mucin secretion, enlarged nuclei with clearly visible nucleoli, mitotic figures may be present, BUT orientation is retained
4. H. pylori demonstartion: special stain:Giemsa or silver impregnation (Wartin-Starry); specific immunohistochemical reaction; FISH→for demonstration of clarithromycin resistance

Microscopy



1.

2+3



Carcinoma sigillocelulare ventriculi (signet ring cell carcinoma)

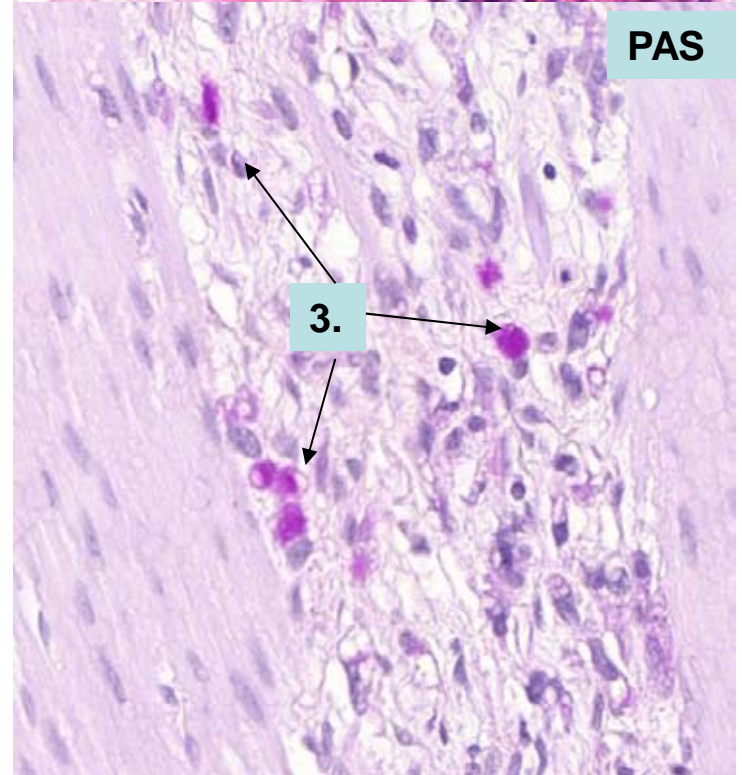
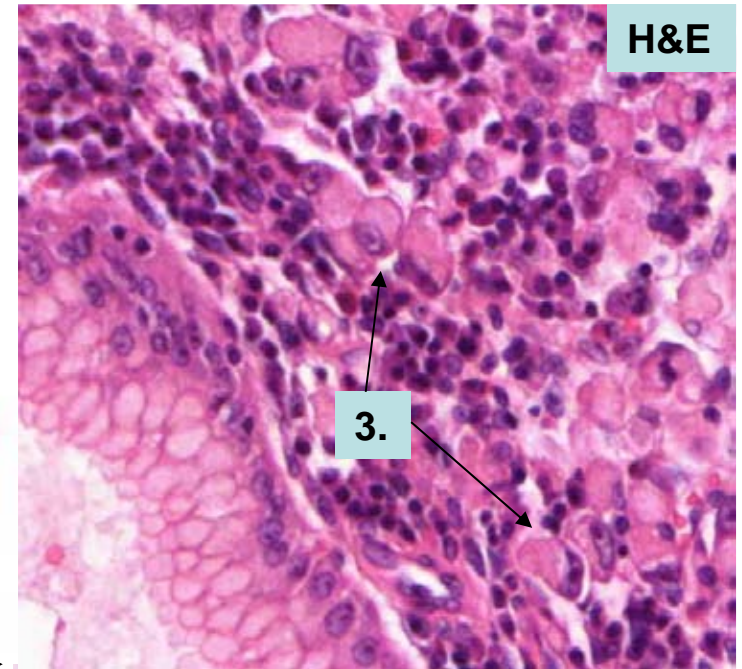
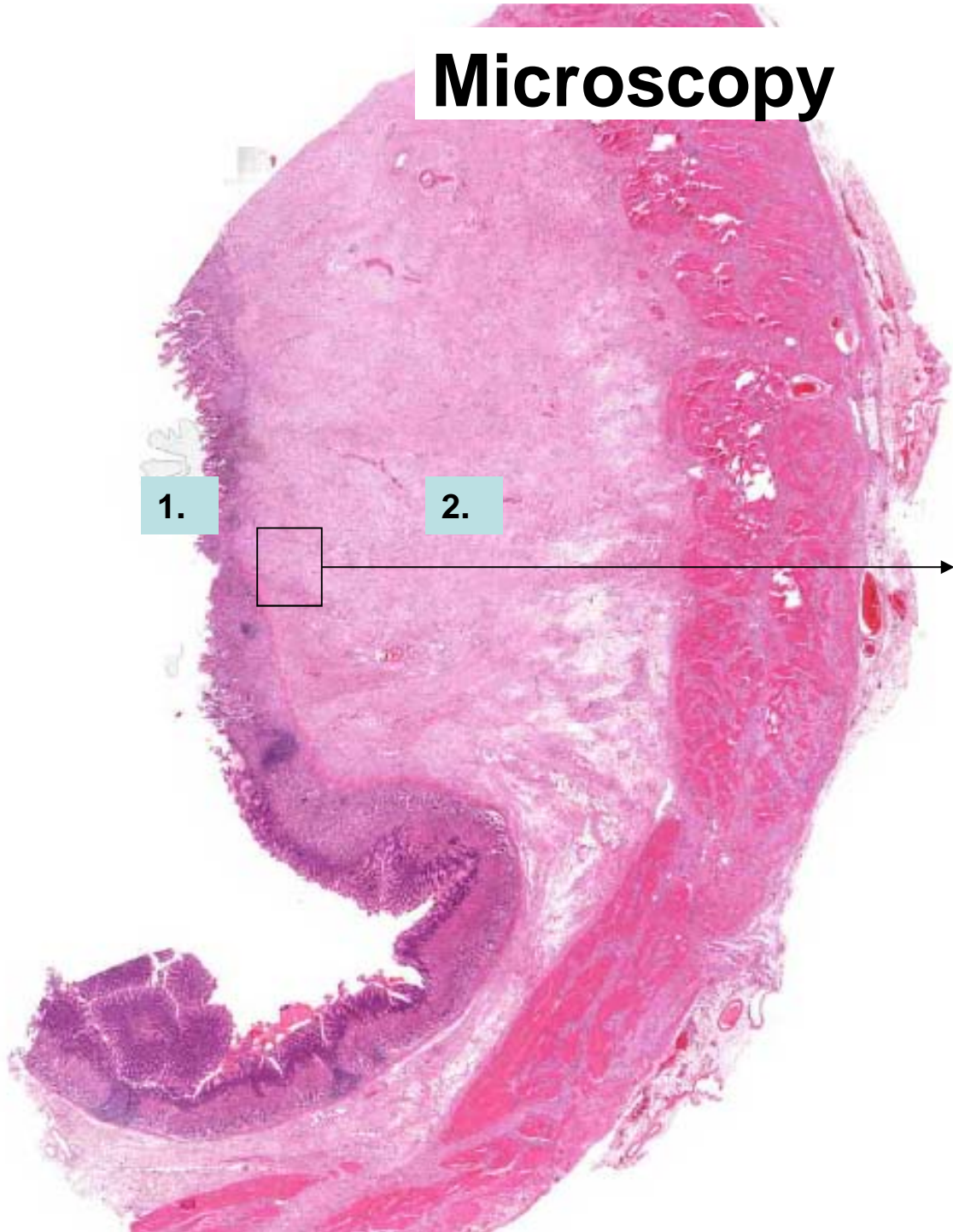
Macroscopy	
Localisation	Mainly stomach, but occasionally may occur in other GI organs, prostate, urinary bladder, breast
Pattern	Diffusely firm, causes thickening of the stomach (linitis plastica)
Colour	Greyish, shiny
Consistency	Very firm
Other	Signet ring cell carcinoma metastasis in the ovary: Krukenberg-tumor
Microscopy	
<ol style="list-style-type: none">1. Diffusely infiltrating pattern, usually advanced stage at the time of the diagnosis, but the covering surface epithelium may be unaffected (endoscopic biopsy may be inconclusive!)2. Stomac wall thickening due to marked desmoplasia3. Cytomorphology: intracytoplasmic mucin (PAS positive), eccentrically located, atypical nucleus with prominent nucleolus (signet ring cell)	

Macroscopy

Cross section: thickened stomach wall



Microscopy



GIST (=gastrointestinal stromal tumor)

Macroscopy	
Localisation	Anywhere in the GI tract. Decreasing order of frequency: stomach-small bowel-colon-other
Pattern	Well circumscribed intramural nodule. Usually few cm, but may be >10 cm.
Colour	greyish
Consistency	Rubbery
Other	In large tumors necrosis, cystic degeneration may be present
Microscopy	
<ol style="list-style-type: none">1. Expansive growth2. Usually spindle cells, less frequently epitheloid3. Factors affecting the biological behaviour: size+number of mitoses +localisation (more frequently malignant in the small bowel)4. Differential dg: myogenic/neurogenic tumors: immunohistochemistry! Mutation of the c-kit gene is characteristic	

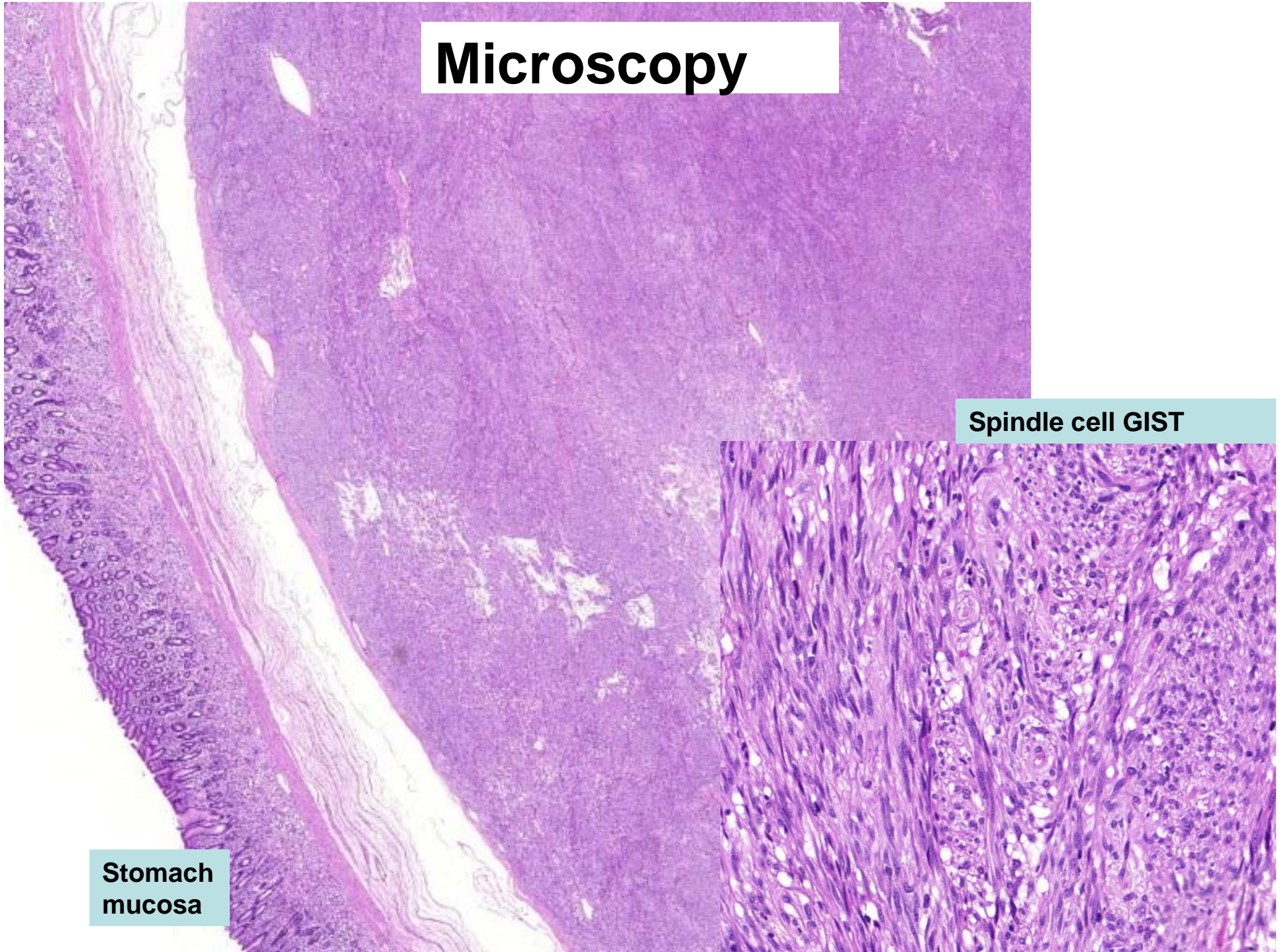
Macrosocopy



Microscopy

Spindle cell GIST

Stomach
mucosa



Villous atrophy in small bowel (coeliacia)

Macroscopy

Localisation	Small bowel (distal duodenum: suitable for biopsy)
Pattern	Diffuse. The villous mucosa is flattened.
Colour	
Consistency	
Other	

Microscopy

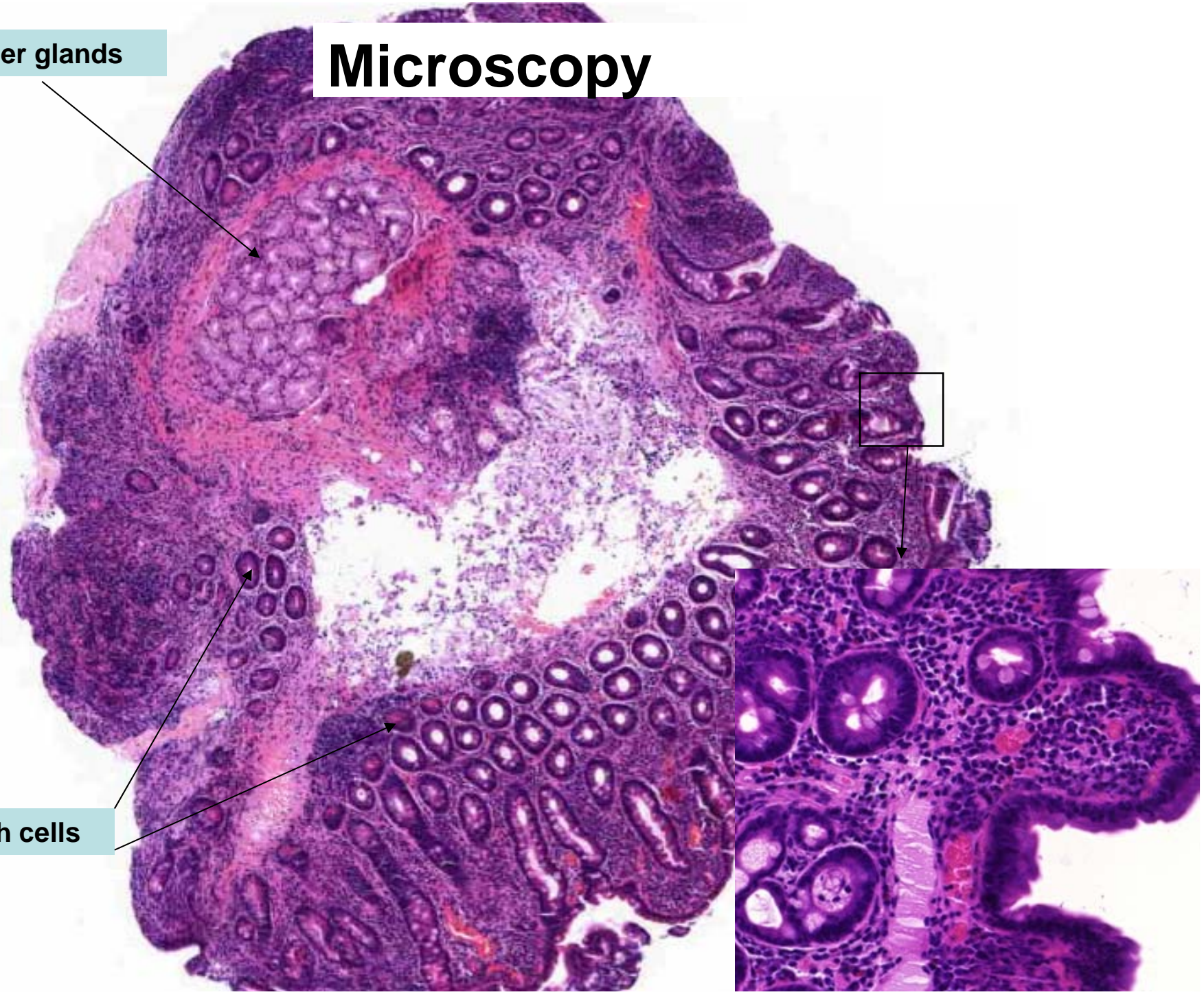
1. In total atrophy, the villi disappear, only crypts are seen in the mucosa. Normally, the villus/crypt ratio is 4-5. As the disease gets more severe, the ratio diminishes, and in most severe atrophy the villi completely disappear. Marked lymphocytic infiltrate (T-cells) in the lamina propria and in the crypt- and villous epithelium (IEL: intraepithelial lymphocytes)

Note: You can identify the organ (when villi are completely lacking) by the presence of Brunner glands and Paneth cells!

Microscopy

Brunner glands

Paneth cells



Colitis ulcerosa

Macroscopy

Localisation	Colon
Pattern	Diffuse or localized. Affects the colon contiguously. Usually starts in the recto-sigmoid colon and also it is most severe here. The mucosa in between the ulcers is edematous and forms pseudopolyps.
Colour	Red-ulcerated
Consistency	
Other	Increased cancer risk!

Microscopy

1. Markedly active inflammation=crypts infiltrated by granulocytes =cryptitis (severe form=crypta abscess). Reactive epithelial atypia is present, dysplasia may develop later!
2. Inflammation does not exceed submucosa

Macroscopy

Chronic ulceration with pseudopolyps



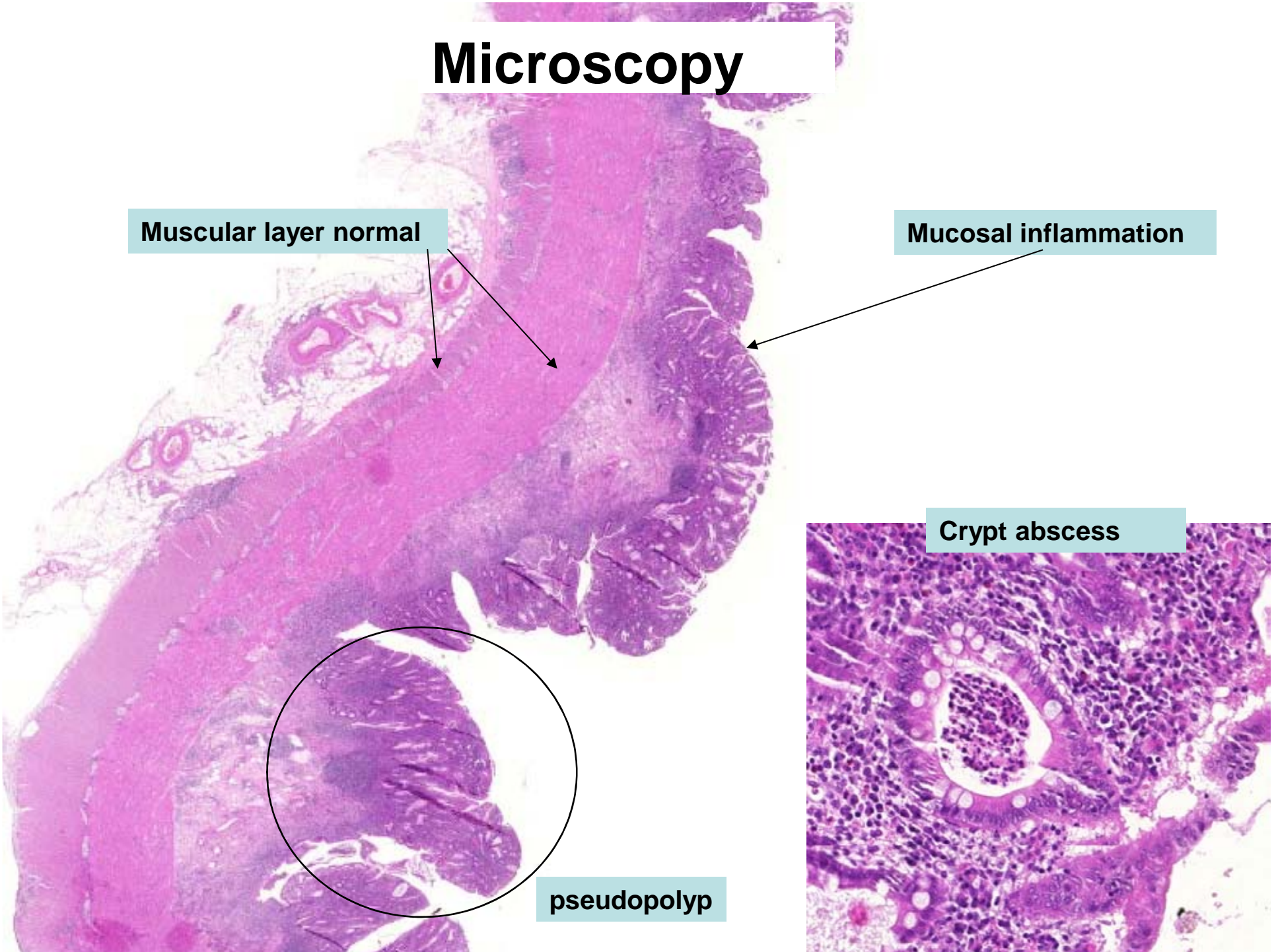
Microscopy

Muscular layer normal

Mucosal inflammation

Crypt abscess

pseudopolyp



Crohn's disease

Macroscopy

Localisation	May present in any part of the GI tract. Most common localisation: terminal ileum-coecum
Pattern	Segmental=inflammed and normal segments alternate
Colour	Redish-greyish
Consistency	Firm, fibrosing inflammation with fissural ulcers
Other	Often causes ileus, stenosis due the inter-loop fistulae Perianal fistulae may also develop.

Microscopy

1. Inflammation with fibrosis: lymphocytic foci, and/or diffuse lymphoplasmacytic infiltrate in all layers of the bowel wall. In the mucosa the inflammation is less active than in CU.
2. Granuloma formation (usually in deeper layers=submucosa)
3. The inflammation spreads over the submucosa
4. Fistula formation=granulocytic infiltrate, granulation tissue, scar tissue

Macroscopy

Segmental; stenotic, sharp-edge, inflammed segment



Microscopy

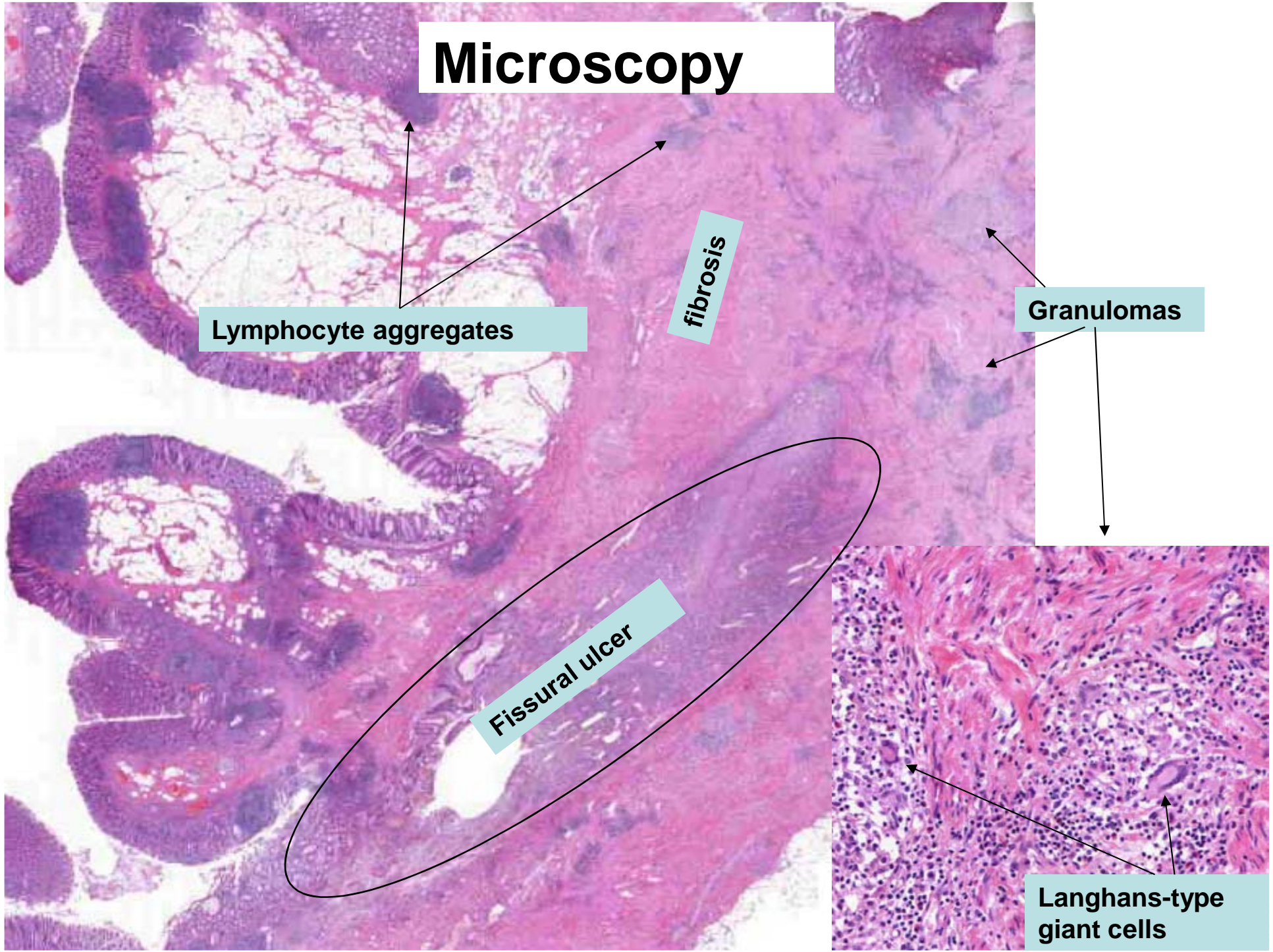
Lymphocyte aggregates

fibrosis

Granulomas

Fissural ulcer

Langhans-type giant cells



Pseudomembranous colitis

Macroscopy	
Localisation	Colon
Pattern	Diffuse-patchy
Colour	Greyish exsudate on the ulcerated mucosa
Consistency	Removable fibrinous exsudate
Other	
Microscopy	
1. Granulocytic infiltrate in the mucosa	
2. Ulcers covered by thick fibrin (eosinophilic material) layer	

Macroscopy



Microscopy

